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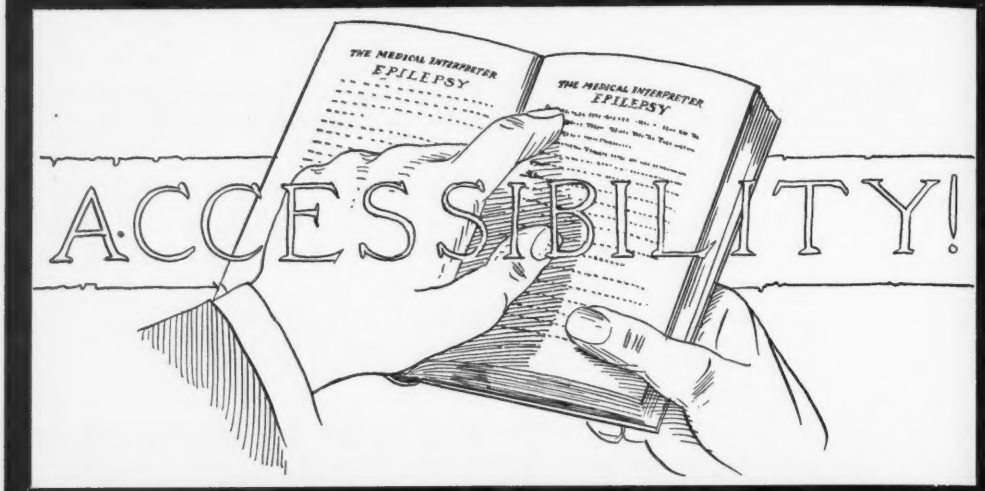

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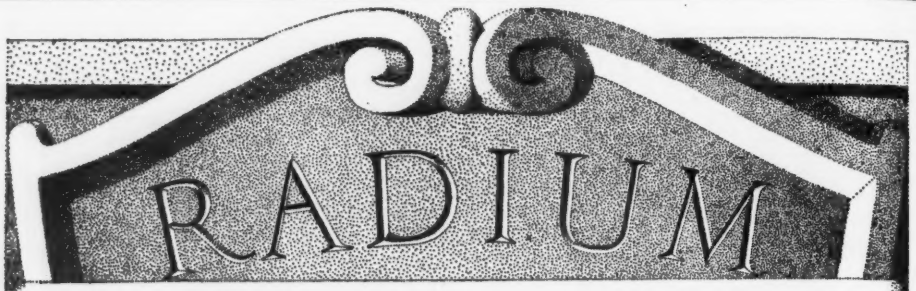

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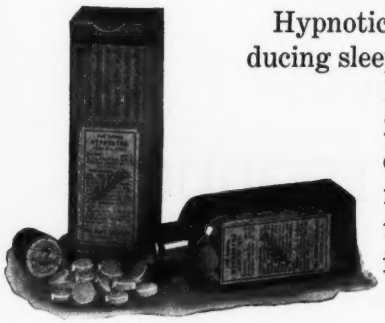

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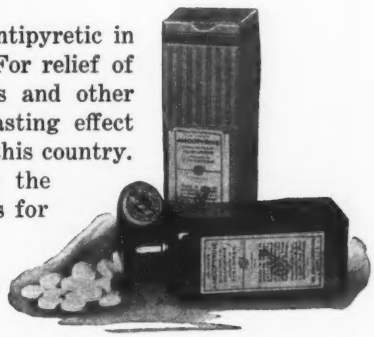

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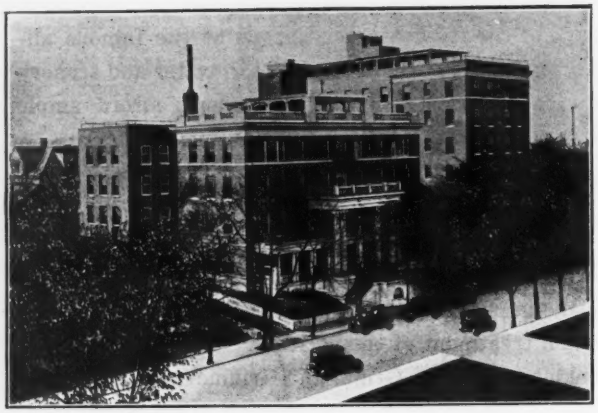

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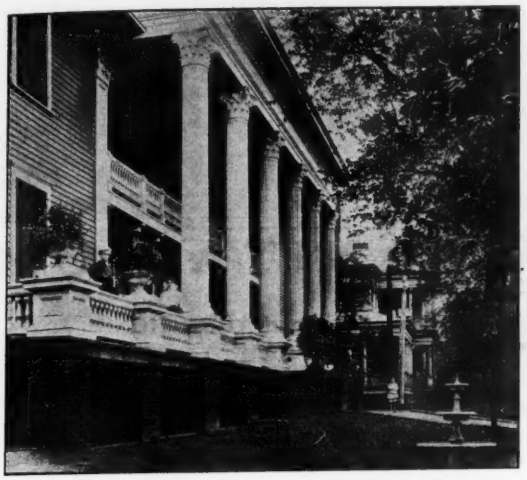

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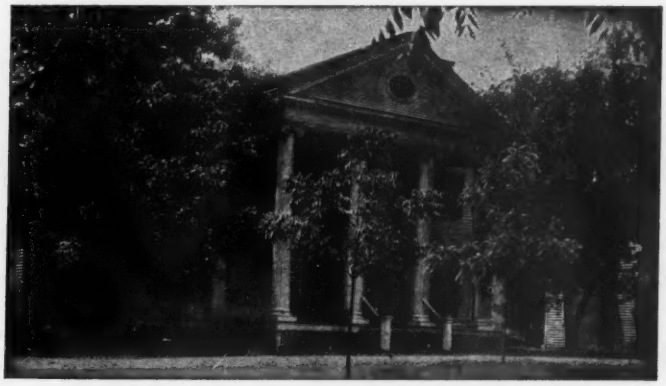

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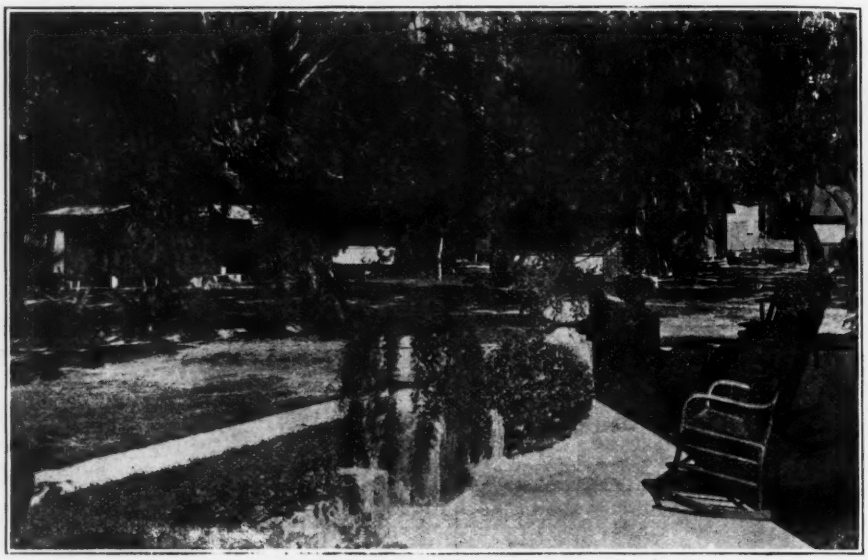

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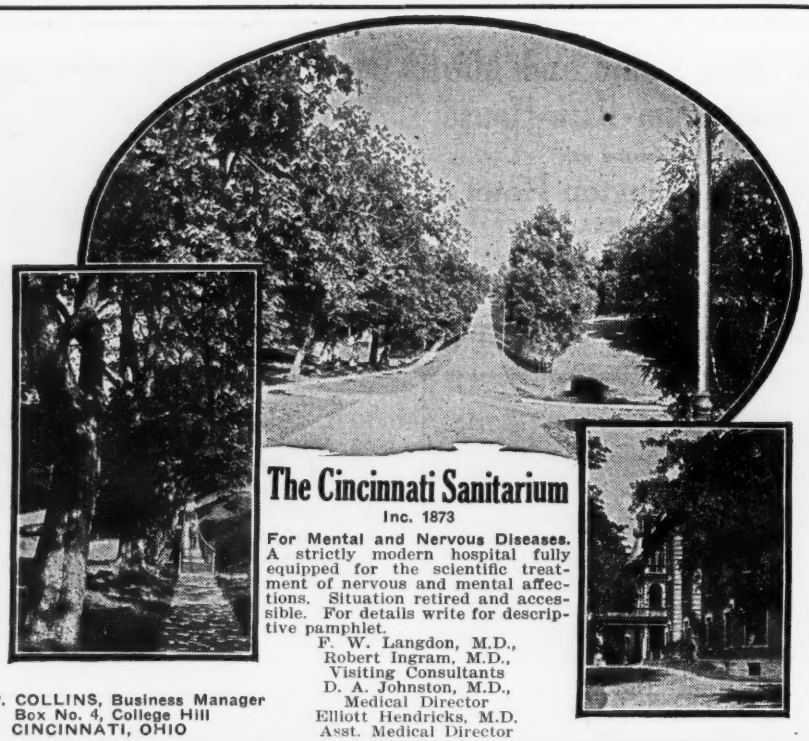

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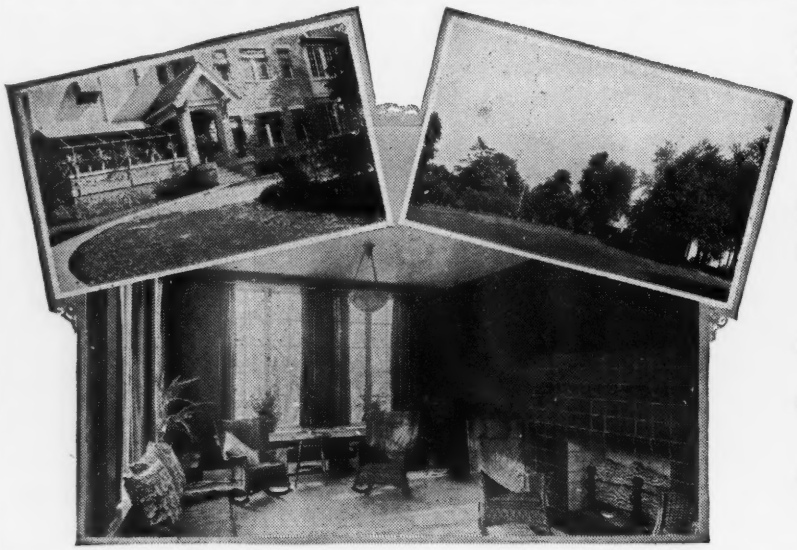

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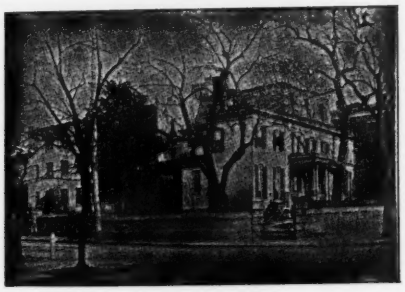

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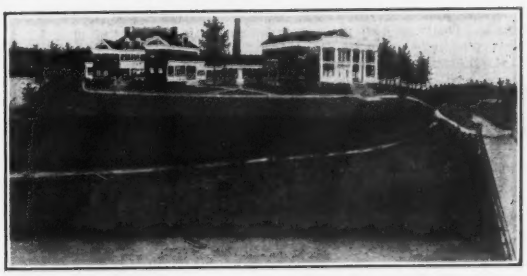

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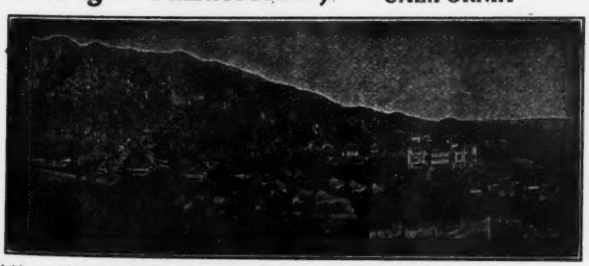

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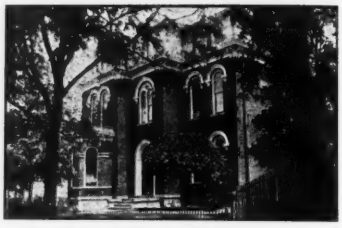

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MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

THE DIAGNOSIS OF ABDOMINAL ADHESIONS*

BY C. W. STRICKLER, M.D.,
Atlanta, Ga.

The profession, generally, appears to have a very clear conception of post-operative adhesions and those resulting from acute inflammations within the abdomen. A good many, however, seem to have overlooked the fact that congenital bands and adherences are very common and that others are formed as we grow older, as shown by Bryant[1] and others. Proof of this unfamiliarity is found in the diversity of opinions given and the treatment advised for relief.

The most frequent diagnoses are as follows: neurasthenia, hypochondriasis, aerophagia, sitophobia, gastric hyperacidity, duodenal and gastric ulcer, gastroptosis, mucous colitis, and chronic appendicitis.

Chronic appendicitis in the sense this term is commonly used may or may not be present. If so, it forms only a part of the clinical picture. The removal of this organ fails to give relief in many instances, as shown by Lichty,[2] and the futility of such a surgical procedure is emphasized by Westmoreland.[3] Symptomatology referred to the gall bladder is another fruitful source of error. We have seen appendices removed and gall bladders drained without the slightest relief and, in a small percentage of cases, the condition is apparently made even worse. If time permitted, we could give cases that have had all kinds of abdominal operations for the relief of symptoms presently to be given, without any permanent benefit.

If we eliminate visceroptosis, which can be easily done, the symptomatology is almost classical. The story is so nearly the same that the diagnosis can be almost positively made from the history as given. Gas, abdominal pains, extreme nervousness, weariness or fatigue, apprehension, symptoms referred to the heart and, usually, constipation, constitute the chief complaints. In addition, different ones had one or more of the following conditions: acid stomach, repeated attacks of acidosis, irritability, insomnia, nausea, nausea and vomiting, dizziness, mental depression, headache and drowsiness. Of these the most distressing were gas, nervousness, fatigue and apprehension. Fear that so much gas would form that its pressure on the heart, as they believed, would cause it to stop beating made some afraid to be alone, especially after meals.

Strange as it may seem, we have seen several of these cases lose control over themselves and weep because of the extreme fatigue from which they suffered. One case had been in bed the greater part of two years, claiming she was too weak to get up, but after having had the necessary corrective operation she was able to be up and showed marked and continued

*Read in Section on Medicine, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

improvement. Nearly all these patients complain of being nervous. In a few this symptom was very distressing, in fact being so marked that it overshadowed all other complaints and, but for the physical findings, we would have been led astray.

The power of initiation is largely lost and, as Westmoreland states, in many, it seems to require as much effort "to start as to perform." These patients are much brighter and freer from symptoms during the morning hours and grow worse as the day advances. Frequently the morning meal starts the day's unpleasantness. They are most unhappy during the afternoon and evening and often lie awake because of excessive tympanites, nervousness or fancied cardiac disease. There is thus formed a vicious circle which can only be broken by the removal of the underlying pathology.

Two types of cases have come under our observation, the one very well nourished and appearing to be in good health; the other pale, emaciated and care-worn. The former looked so well and reflected so little the picture of suffering that they failed, as a result, to receive any sympathy from family or friends and, therefore, delayed consulting a physician until, as they state, "they had to have relief." The latter were in their present state of health mainly because of starvation, preferring this condition rather than the suffering consequent upon eating a normal meal. Many had been put on milk diets or had been given rest cures with apparent restoration to health, but upon taking up their former manner of life with its stress and duties they soon suffered a relapse and were before a great while in their former physical condition. Occasionally other conditions of minor importance were found. Examination of the heart usually revealed, in cases suffering with this organ, occasional extra systoles and either the presence or history of paroxysmal tachycardia.

The examination of the abdomen did not, as a rule, show sufficient distention to be a cause of complaint. Collections behind the constrictions or angulations could be detected and often be forced to pass by the palpating fingers, and at the time the patient stated that this passage of gas caused relief if suffering. There was distinct muscle rigidity over the location of the adhesions or bands. Of this we are quite sure because we either had reports of or witnessed the operations. Some were sensitive to pressure, others not. Occasionally marked rigidity was lacking but, if so, a few days of forced feeding with rough foodstuffs would establish the usual physical findings.

It might be claimed that the unyielding abdominal wall was more marked when the appendix was involved, but such is not the case. Several of the worst cases we have had revealed little or no microscopical pathology of this organ. Occasionally in the cases of those suffering with transient nausea, deep pressure would elicit this symptom. The x-ray was helpful in eliminating gastric and duodenal ulcer, in locating points of stasis, revealing angulations and constrictions and in locating the position of the appendix and the mobility and position of the gut. However, too much dependence cannot be placed upon this procedure, as the following two cases, taken from a number, will illustrate:

One was examined in two of the best clinics in this Country and pronounced normal in every way, was advised to rest and seek diversion, but, when this advice was followed, obtained no relief. An operation revealed a rather wide band, causing rotations and angulations of the duodenum near the pylorus.

Another, because of a plainly to be seen and constant constriction of the descending colon just below the splenic flexure, was diagnosed stricture of the colon. However, despite this diagnosis and the fact that the location of greatest pain was at this point, we were inclined to consider this a reflex spasm for the reason that all the physical findings were on the opposite side. This was proven at operation. Both these cases have been relieved and are showing continued improvement.

In conclusion, I might say that the majority of these cases are curable if operated upon by a surgeon who understands the development and rotation of the gut with the abnormalities as described by Huntington[4] and who makes an incision of sufficient length to view his work. I wish to place especial emphasis here, for the reason that the smaller and more or less obscure adhesions give even more trouble than the large ones. Following this surgical procedure, these pa-

tients should have the care of a competent clinician until health is fully restored. If this could be done in all cases, failures would be conspicuous by their absence and many of the so-called "abdominal invalids" would have something worth while done for their relief.

The length of time necessary to obtain the desired results depends upon the number of months or years the patient has suffered from the distressing symptoms. In our experience relief has come to some cases within a few weeks; in others of long standing, two years are required for complete restoration to health.

ILLUSTRATIVE FINDINGS IN TWO CASES OPERATED UPON BY DR. W. F. WESTMORELAND

Case I.—There was a retrocecal appendix. The ileocecal fold was obliquely drawn forward to the mesentery of the appendix, infolding the ileum on itself. The hepatic flexure was almost occluded by the omentum's growing across, both over and under, the ascending colon at this point to the parietal peritoneum, firmly fixing as well as occluding almost completely the colon at the flexure at this point.

Case II.—The cecum was mobile, but with displacement of the ileocecal fold, which obliterated the ileocecal fossa and blended with the mesentery of the appendix and a remnant of the ovarian or Reid's ligament. The cecum and ascending colon in this case was so large and dilated that it looked like a case of Hirschsprung's disease. In this case the colon was almost occluded by a small tight band around the hepatic flexure arising from the parietal peritoneum and growing around the colon as a small suspensory ligament, back to its point of origin. The fold of the colon concealed this band, but the enormous distension of the colon showed there must be some constriction at this point and it was discovered by the examining fingers. When the ileocecal fossa was opened up along the line of cleavage and the ileocecal fold removed, the ileum was lengthened about two inches, with no raw surface.

The patient had two ovaries with blood cysts and both ovaries and tubes had to be removed. There was a bad retro-flexion and the uterus had a ventral suspension. She also had one of the tightest anal fissures I ever stretched, with a large part callous ulcer. There was about as much surgery in this case as I have ever done on one patient, but she has had a comfortable, uneventful recovery. This is the first of these tight bands completely encircling the gut that I have seen.

ILLUSTRATIVE FINDINGS IN A CASE OPERATED UPON BY DR. LEROY W. CHILDS

A five-inch incision with the umbilicus as the middle point was made over the right rectus muscle. The muscle was exposed and displaced from its sheath toward the middle line. The abdomen was opened. Exploration of the right ileac region showed a Jackson's veil obscuring the appendix which had become adherent to the cecum, causing it to rotate inwardly and posteriorly. This adhesion, which had caused rotation of the cecum, caused the small bowel to enter the large bowel in such a manner as to kink the former between one and two inches from the ileocecal valve. The adhesions were carefully separated, the appendix removed and all raw surfaces covered as completely as possible. Exploration of the stomach, liver and gall bladder showed these organs negative, although the liver was two finger breadths below the rib margin. There was no pathology in the upper abdomen. The abdomen was closed without drainage.

REPORT OF CASE HAVING HAD PREVIOUS OPERATION FOR APPENDICITIS WITHOUT RELIEF, BY DR. L. SAGE HARDIN

The lower border of the liver and the pyloric portion of the stomach were at the upper naval margin. There was a scar running from the gall bladder sulcus to the falsiform ligament on the front of the liver and omental adhesions to the abdominal wall at the site of the previous operation. These were resected, the proximal end inverted and the distal end turned into the abdominal wall during closure. There was a band one-fourth inch wide passing from the anterior portion of the colon about its middle third to the abdominal wall, producing a constriction at this point. This was cut and the end covered under the peritoneum. A second and distinct band, rather dense, was found attached to the first portion of the transverse colon, holding it well back onto the ascending colon and thence across to the abdominal wall. When this was cut and the raw surface covered under the peritoneum, the hepatic flexure assumed its normal pleasant curve under the liver. Another band running from the stomach prepyloric to the duodenum and thence to the transverse colon, held forward the duodenum, producing an obstruction and resulting in a decided enlargement. This was incised and the raw surface turned back onto the stomach and transverse colon. There was a general thin Jackson's veil covering over the whole duodenum and transverse colon at this point.

The pyloric muscles proper were very heavy and the stomach muscles markedly hypertrophied. Hence, to relieve the retraction that would take place at this point, a small Finney pyloroplasty was done. The abdominal peritoneum was closed, everted. The patient returned to the bed in good condition without shock, with pulse of 108, and was placed in the Trendelenberg position to allow the viscera to assume the normal position in the upper abdomen.

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No. 2.—Age, 50 years. Previous operations, none. Chief complaint, gas, tachycardia, nausea, occasional vomiting, constipation, nervousness. Duration, several months. Result following operation, cured.

No. 3.—Age, 50 years. Previous operations, none. Chief complaint, extreme nervousness, gas, tachycardia, fatigue, constipation. Duration, several years. Result following operation, cured.

No. 4.—Age, 20 years. Previous operations, none. Chief complaint, nervousness, weakness, bodily pain, palpitation, much gas, some abdominal pain, frequent eructation, constipation. Duration, several months. Result following operation, cured.

No. 5.—Age, 37 years. Previous operations, right kidney anchored. Results, condition worse since. Chief complaint, nervousness, insomnia, weakness, tachycardia, depression, painful joints. In this case bowels were irregular. Duration, several years. Result following operation, greatly improved.

No. 6.—Age, 24 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, burning, fullness and uncomfortable feeling in stomach; some nausea; constipated. Duration, several years. Result following operation, cured.

No. 7.—Age, 19 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, insomnia, pain in right side of abdomen, weariness. An acute attack of nausea and vomiting. Duration, about two months. Result following operation, cured.

No. 8.—Age, 23 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, indigestion, localized gastric pain, small area below ensiform cartilage, very severe after eating; nervousness, weakness; had several rest cures. Duration, four years. Results following operation, improved. Refused rest cure, hence imperfect result.

No. 9.—Age, 51 years. Previous operations, none. Chief complaint, gas, slight pain across upper abdomen, constipation. Duration, two years. Results following operation, greatly improved. Left hospital and refused to carry out directions.

No. 10.—Age, 37 years. Previous operations, has had peritonitis, suspension of uterus, removal of right ovary, adhesions broken up, fistulo-in-ano. Results, no relief. Chief complaint, nervousness, weakness, indigestion, gas, occasional nausea and vomiting, acidosis. Duration, several years. Results following operation, relieved of all symptoms; apparently cured.

No. 11.—Age, 32 years. Previous operations, tonsillectomy and adenoids. Results, not given. Chief complaint, gaseous distention, belching and regurgitation of food; weariness, depression, constipation. Duration, six years. Result following operation, cured.

No. 12.—Age, 29 years. Previous operations, none. Chief complaint, nervousness, insomnia, gastric discomfort after eating. Duration, six months. Result following operation, cured.

No. 13.—Age, 46 years. Previous operations, none. Chief complaint, nervousness, fatigue, discomfort right side of abdomen, insomnia, constipation. Duration, seven years. Result following operation, cured.

No. 14.—Age, 24 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, bilious attacks, bad taste in mouth in morning, gas, regurgitation of food, fatigue. Duration, one year. Result following operation, operated upon in another city; report from physician satisfactory.

No. 15.—Age, 8 years. Previous operations, none. Chief complaint, frequent attacks of acidosis, in three of which she had convulsions; constipation, very nervous, transient glycosuria. Duration, five and a half years. Result following operation, improved.

No. 16.—Age, 49 years. Previous operations, appendectomy 25 years previously. Results, no relief. Chief complaint, abdominal pain, distension—worse since his operation; tachycardia. Duration, 25 years. Result following operation, cured.

No. 17.—Age, 39 years. Previous operations, appendectomy. Results, no relief. Chief complaint, fear of crowds, constant headaches, marked fatigue, mucus in stools, marked irritability, pain in right leg and hip. Duration, several years. Result following operation, greatly improved. Good results expected. Delayed, due to patient's having to return to work too early.

No. 18.—Age, 27 years. Previous operations, none. Chief complaint, eructation and gas, occasional nausea. Bowels fairly regular. Duration, one and a half years. Result following operation, cured.

No. 19.—Age, 56 years. Previous operations, none. Chief complaint, fullness in stomach after eating, gas, acid stomach, extremely nervous. Duration, several years. Result following operation, cured.

No. 20.—Age, 26 years. Previous operations, tonsillectomy. Results, not given. Chief complaint, constant headache, very nervous, indigestion and heart burn, much gas; feels as if she would faint easily; insomnia. Duration, five years. Result following operation, cured.

No. 21.—Age, 30 years. Previous operations, none. Chief complaint, nausea after eating, gas, backache and sensation of weight over pelvic region. Duration, several years. Result following operation, cured.

No. 22.—Age, 39 years. Previous operations, appendectomy. Results, not given. Chief complaint, gas, nausea and vomiting. Duration, several years. Result following operation, cured.

No. 23.—Age, 41 years. Previous operations, herniotomy, tonsillectomy, some nasal operation. Results, not given. Chief complaint, nervousness, insomnia, dull pain in right hypochondriac region and epigastric region most of the time, gas, depression. Duration, three years. Result following operation, cured.

No. 24.—Age, 18 years. Previous operations, appendectomy. Result, no relief. Chief complaint, pain in right side since operation; frequent micturition; no urinary trouble; occasional reaction to sugar before operation. Duration, two years. Result following operation, greatly improved.

No. 25.—Age, 21 years. Previous operations, none. Chief complaint, epigastric pain, almost constant nausea, constipation. Duration, six to seven years. Result following operation, cured.

No. 26.—Age, 20 years. Previous operations, none. Chief complaint, nervousness, fatigue, foul breath, constipation, nausea, acid stomach and eructation after eating. Duration, ten years. Result following operation, cured.

No. 27.—Age, 22 years. Previous operations, none. Chief complaint, dizziness, fatigue, nervousness, nausea in the morning, cramping abdominal pains sometimes before and after meals. Duration, four years. Result following operation, cured.

No. 28.—Age, 25 years. Previous operations, none. Chief complaint, indigestion all her life, nervousness, fatigue, eructation sour food, burning in upper abdomen, transient sugar. Duration, many years. Result following operation, cured.

No. 29.—Age, 28 years. Previous operations, none. Chief complaint, anorexia, nausea after eating, no pain, drowsy feeling; not constipated. Duration, one year. Result following operation, cured.

No. 30.—Age, 22 years. Previous operations, none. Chief complaint, indigestion, loss of weight, cough; bowels regular. Duration, several years. Result following operation, cured.

No. 31.—Age, 41 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, weakness, nervousness, nausea, frequent headaches, constipation. Duration, four years. Result following operation, greatly improved; complete recovery expected.

No. 32.—Age, 32 years. Previous operations, tonsillectomy, operation on ethmoid cells. Results, not given. Chief complaint, nervousness, weariness, fatigue, bodily pain, much gas, choking sensation when she eats, nausea. Duration, twenty months. Result following operation, improved. Environment and lack of means greatly delayed complete recovery.

No. 33.—Age, 50 years. Previous operations, none. Chief complaint, skipping heart, depression, marked fatigue, hyperacidity. Duration, five years. Result following operation, cured.

No. 34.—Age, 30 years. Previous operations, tonsillectomy, adenoids, hemorrhoidectomy, D. and C. Result, not given. Chief complaint, indigestion, nervousness, fatigue, pain over lower abdomen, nausea after eating, sour stomach. Duration, several years. Result following operation, cured.

No. 35.—Age, 39 years. Previous operations, appendectomy; right ovary removed; suspension. Results, no relief. Chief complaint, cannot sit up without abdominal pain; stomach full and much gas after eating, followed by nausea and acidity. Duration, post-operative. Result following operation, all symptoms relieved; doing well last report.

No. 36.—Age, 25 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, constipation, toxic headaches, biliousness. Duration, several months. Result following operation, cured.

No. 37.—Age, 19 years. Previous operations, none. Chief complaint, dull pain in right side, constipation, much gas, frontal headaches. Duration, three years. Result following operation, cured.

No. 38.—Age, 44 years. Previous operations, none. Chief complaint, frequent bilious attacks, frequent eructation, pain in upper abdomen, constipation. Duration, several years. Result following operation, cured.

No. 39.—Age, 35 years. Previous operations, none. Chief complaint, soreness in epigastrium, gaseous distention, vertigo, dizziness, constipation. Duration, two years. Result following operation, cured.

No. 40.—Age, not given. Previous operations, none. Chief complaint, acidity, gas, choking sensation, constipation. Duration, several years. Result following operation, improved. Condition existed too long to correct mental aspects of case.

No. 41.—Age, 46 years. Previous operations, none. Chief complaint, pain in stomach, gas, constipation. Duration, many years. Result following operation, symptomatically relieved. No recent report.

No. 42.—Age, 25 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, pain lower abdomen, constipation. Duration, two years. Result following operation, did well after operation; failed to report later.

No. 43.—Age, 52 years. Previous operations, none. Chief complaint, hyperacidity, eructation, myalgia. Duration, many years. Result following operation, symptoms relieved. Doing well one year after operation.

No. 44.—Age, 56 years. Previous operations, tonsillectomy. Result, not given. Chief complaint, indigestion. Duration, all his life. Result following operation, cured.

No. 45.—Age, 38 years. Previous operations, none. Chief complaint, epigastric pain, acidosis, chronic constipation. Duration, seven years. Result following operation, cured.

No. 46.—Age, 33 years. Previous operations, none. Chief complaint, acidity, gas, eructation, nervousness, fatigue. Duration, not given. Result following operation, cured.

No. 47.—Age, 38 years. Previous operations, none. Chief complaint, fatigue, depression, tachycardia, insomnia, constipation. Duration, several years. Result following operation, cured.

No. 48.—Age, 24 years. Previous operations, none. Chief complaint, gastric pain, gas, constipation, nervousness, fatigue. Duration, several years. Result following operation, cured.

No. 49.—Age, 22 years. Previous operations, appendectomy. Result, no relief. Chief complaint, indigestion, gas, fullness, diarrhea, constipation, pain. Duration, several years. Result following operation, symptomatically relieved; cure expected.

No. 50.—Age, 34 years. Previous operations, none. Chief complaint, pain in upper abdomen, distention, occasional nausea, frequent digestive upsets, nervousness, slight constipation. Duration, several months. Result following operation, cured.

[Author's Note.—All these cases have been under observation for a sufficient length of time following operation and treatment to have a fair idea of the result.]

REFERENCES

1. Bryant: American Journal of the Medical Sciences, January, 1922, p. 75.
2. Lichty: Journal A. M. A., September 9, 1922, p. 887.
3. Westmoreland: Unpublished. To appear in the Journal of the Med. Assn. of Georgia.
4. Huntington: Anatomy of the Peritoneum and Abdomen.

DISCUSSION

Dr. Willis F. Westmoreland, Atlanta, Ga.—This condition is purely a mechanical one, and it cannot be cured by medicine, rest, or diet. It is better to name these conditions right-sided abdominal conditions, as it is impossible to describe them under any one term.

The primary condition is always of embryological origin. It is developed in this way: as the colon grows downward by picking up the attachment of the parietal peritoneum, the lower condition is produced by some irregular growth in the ileocecal valve fold, which, instead of extending across the cecum, crosses down the fossa and pulls down the ileum. When these folds are separated the ileum is extended one-half or two inches. For instance, small tight bands will produce more of an effect than large or broad bands or several bands together. If the colon at its lower point becomes twisted, stasis is produced. I am satisfied in my own mind that embryologically the question is one of posture. The development of the gut has not kept pace with the erect position. When we walk on all fours the sigmoid or colon empties itself. Bands interfering with the colon will produce more or less intestinal stasis. In other words, the contents constitute a puddle, so that you get the toxic effect of the absorption there. These small bands will aggravate or produce more angulation of the gut than the broad bands.

The removal of what is known as Lane's kink, which is very broad, has no effect for the simple reason that a broad band will not angulate the gut.

I shall not go into the symptom-complex of these cases, because Dr. Strickler has covered that phase of the subject very well.

The first patient I operated upon was in 1906. I have always advocated a straight rectus incision, which gives me an opportunity for inspection which we do not get by the more popular McBurney incision. As soon as I recognized that the appendix did not produce the symptoms, it occurred to me that if the bands went on to angulation, it had something to do with the causation of the symptoms, and that it was necessary to correct the angulation. The removal of the appendix alone does not correct the condition. The appendix is an associated cause—never the primary cause. The appendix may aggravate the condition, but does not cause it. The removal of the appendix in 75 cases did not do any good at all. In quite a percentage of cases, where the operation of ligating the mesentery en masse was done, the distortion has increased and the patient was made worse by the operation for the removal of the appendix.

As to the effect of rest cure and diet, I shall simply mention one case. A patient had an attack when away from Atlanta and was treated by a stomach specialist, who made a diagnosis of visceroptosis. She was put to bed, the foot of the bed elevated, and the stomach strapped up. She was kept in bed for three weeks, during which time she gained twenty-odd pounds.

Dr. George M. Niles, Atlanta, Ga.—The subject of adhesions as well as the syndrome of symptoms, which Dr. Strickler so graphically portrayed, is one that is familiar to us all, and especially to those who endeavor to treat gastro-intestinal disorders. The symptoms complained of include those of depression, "biliousness," a term which we use for lack of a better one, gas and distress. The symptom of gas is dinned into our ears so often that some of us hope some day to reach that happy state in those Elysian fields where we shall hear no more about the symptom of gas.

A little over a year ago, at a meeting of the American Roentgen Ray Society, Dr. Gregory Cole, of New York, read a paper on "Congenital Adhesions Around the Pylorus and in the Right Upper Quadrant of the Abdomen," which he called by the rather peculiar name of "cobwebs in the attic." He spoke of them as congenital and said that they can be diagnosed only by the intelligent use of the roentgen ray.

As to the effect of these adhesions, I judge Dr. Strickler and Dr. Westmoreland are on the right track. In congenital adhesions, where they cause lack of rotation, nothing can relieve the patient except well considered surgical treatment and care; but, gentlemen, operation for post-operative adhesions have not always in my observation given permanent relief. I have known of numbers of patients who were operated upon for post-operative adhesions by well qualified and careful surgeons; but only temporary relief was obtained, and the last state of these patients was worse than the first. Therefore, before entering into a surgical operation for post-operative adhesions, I think that point should be carefully considered.

Several years ago I was called upon to talk upon the subject of adhesions before the Surgeons' Club of Atlanta, and I made this illustration, which seemed to appeal to some of my hearers and friends, namely, a surgical operation for

post-operative adhesions might be likened to a cat fight, and you know that a cat fight generally means more cats.

Dr. Sydney R. Miller, Baltimore, Md.—I cannot refrain from entering an energetic protest against what seems to me to be a further and unwarranted inroad of surgery into the legitimate domain of internal medicine. Surgeons are notoriously not keen students of the personality factor of patients—and are far too prone to acquiesce in operating, too often a lamentable result of immature clinical study by the internist. Surgery today occupies a place of prominence, in contrast to medicine, which is both incongruous and productive of much harm.

If I understood Dr. Strickler's paper correctly, he speaks of a large and common group of cases upon which surgery should be the last thing perpetrated, not the first. These are patients too often tossed about from one specialist to another, nervous, malnourished, and complaining of a host of symptoms referable to the gastro-intestinal system, anorexia, constipation, vague discomforts, "biliousness," etc. They are egocentric sufferers, victims of that malign psychic state of over-awareness of themselves. Most of them have, among other things, certain fears of foods, or have been made worse by ill-founded dietetic fads, of either public or professional origin. Milk almost always makes them "bilious." X-rays will invariably show some degree of ptosis and evidences of probable adhesions. These people need most, patient hours of personality study, reassurance based upon meticulous observation, and must be taught how to meet certain of their annoying but trivial symptoms. Persuade them that the Lord was not in His dotage when He made foods to eat; encourage them to eat regardless of anorexia; persistently paint the alluring picture of health upon an ideal weight basis; and above all adhere to a systematic daily regime. As weight increases, digestion improves; the clouds of doubt and depression lift; and adhesions are broken by wedges of physiological fat.

Dr. W. R. Houston, Augusta, Ga.—The group of cases to which Dr. Strickler referred, cases of extreme asthenia with predominating gastro-intestinal symptoms, are among the most perplexing that the internist is called upon to study. I have recently had occasion to review the literature upon the subject. An article by Dr. Bryant in the *Annals of Surgery* for 1912 reports a number of these cases under the name of "Membranous Pericolitis." He seems to think with the author that relief may be secured merely by the breaking up of adhesions. A year ago in the *British Medical Journal* appeared the monumental contribution of Waude in which nearly two hundred cases were reported with the results of operation. His paper is entitled "Mobile Ascending Colon." A large percentage of his cases had gone through an antecedent appendectomy without relief. By means of his operation which consists in a thorough-going fixation of the acending colon to the posterior abdominal wall he reports brilliant successes. He emphasizes particularly the extreme fatigueability of the patient as the major symptom, other symptoms such as gas and discomfort after eating being merely expressions of a general fatigueability. These cases come up so often for consideration and the internist is so hard put to it by the persistence of them in certain instances that he is naturally disposed to accept the surgeon's suggestion that they be operated upon. In nearly every community of any size there is to be found a surgeon who is sanguine as to the results of operative treatment in these cases. Yet the advisability of operative treatment has never been largely attended to and in the ten years that have elapsed since it was first prominently brought forward the general consensus has been adversative. As Dr. Strickler has said, "Subsequent to the operation it sometimes requires two years of medical care to restore these patients to normal." There must be very few cases in which two years of intensive medical re-education and discipline may not accomplish these results, and it is not improbable that the lack of energy on the part of the physician and the lack of perseverance in the patient is the cause of our having them go to the surgeon for treatment which after all may possibly be in itself largely suggestion.

Dr. Henry S. Ward, Birmingham, Ala.—This, gentlemen, to me is the old story. Apparently every year or two some one comes forward with a marvelous method of treatment. I think a large number of these cases belong to those in which Lane removed the colon. The same syndrome the essayist described in his paper is also described by Lane, and with the removal of the colon it would seem they all got well. I have been in the habit of taking out the tonsils in some of these cases. I think it is the same old class of people handled in a new way. Some of these patients are so down in the depths, whose will power is so weak, that they have not the ability to adjust themselves to the ordinary way of living. Frequently, I think a surgical operation is a sort of mental or psychic shock, and with the aid of the medical man after operation the patient is put on the road to recovery. Every now and then we all get hold of these cases. They have had surgical shocks, but not the mental building up by some good internist. If the surgeon will give the medical man his proper rights after he gets through with these patients, we shall have much better results than we have had in the past. It is a good thing for the surgeon and internist to get together and treat this type of case. The surgeon can do whatever surgical work needs to be done, but after that they should be sent to medical men to be taken care of.

Any form of treatment properly boosted often relieves. Otherwise, no matter what the treatment, we fail. Many again, both by heredity and environment, seem not to possess sufficient moral fiber to meet the strain of life and shield themselves from invalidism. So far, there is no royal cure.

Dr. Tom A. Williams, Washington, D. C.—I had no intention of taking part in this discussion until I heard two of the internists present attack the paper and the first discusser of the paper.

We are talking of different things altogether. Dr. Miller spoke about a disease which we all know very well, especially we neurologists, and I am very glad that internists are beginning to find gastric neuroses (as we used to call them) which are cured by persuasion, suggestion and re-education, as he explained; but I do credit the author of the paper with a degree of common sense greater than not to be able to differentiate that syndrome when he sees it. The paper is a real contribution to a study of a difficult subject, namely, the abdominal neurasthenic, to use a loose term. He specifically stated that a patient in whom there were large bands was not improved if these bands were divided, and he would exclude any effect of suggestion by the operation from his general view of his cases. The patients who were improved were those who had small bands, small adhesions, which were formerly overlooked. So it would seem to me we should not simply laugh away this paper. I take it that there is no quarrel between the physician and surgeon in regard to this class of cases. If there is, the surgeon and internist ought to stop fighting. Dr. Strickler has given us a definite contribution of a specific case which is not psychic at all, who has not his stomach in his head, who is not a phobiac, in the first place, but is a phobiac only for the distress he feels in the abdomen, and misinterprets that as possibly a swelling which will stop the heart from beating. The patient is weak because he has intestinal stasis and constipation and is intoxicated, and not because he thinks he is weak. He is not in reality a psychic case at all, but a patient suffering from a lesion such as the essayist has pointed out, and if the essayist knows how to differentiate that case from the cases which have a phobia and are purely functional and can be cured, he has given us a valuable contribution which I for one certainly welcome.

Dr. Strickler (closing).—The paper received about the reception I expected. In as much as these cases have been under observation for fourteen years, the conclusions presented are not the result of any snap judgment on our part.

Many of these patients had been treated for years before we were consulted, several having been to some of the best clinics in this Country, and yet had obtained no permanent relief. However, when we had them operated upon, the underlying pathology relieved, and the proper after-attention given, the results have been most gratifying. "The proof of the pudding is the eating thereof." Before this plan of treatment, many of these cases were an economic loss. After this plan of treatment they are able to take up the duties of life and perform them in a satisfactory manner.

We do not, by any means, operate upon all these cases. By proper rest, diet and exercise many of them can be put in a reasonably good state of health and remain comfortable as long as they follow directions. Others, no matter what plan of treatment is adopted other than the one under discussion, never remain well until the mechanical condition is corrected. For the information of one of the speakers who referred to the removal of tonsils, I may say that many of these patients have had this operation without any benefit whatsoever.

In regard to the length of time required for recovery, in cases of short duration, before fixed ideas have become established, this is reasonably prompt. However, when persons have suffered for years, a number of weeks and sometimes months are required in order to re-educate these patients and prove to them that it is perfectly possible to do many things which they consider deleterious or impossible.

I am quite satisfied that many of the bad results following operations of this character have been due to the fact that the cases were dismissed too early and did not receive the after-care which they demand. The operation is only the first step toward the cure. All these patients should, following the operation, be placed under the care of a competent internist until they are fully restored to health. In certain instances a rest cure is indicated, followed by a change of scene and environment and an abundance of outdoor exercise. In addition, they must be taught the right attitude toward life, its duties and responsibilities. We have found by actual experience that this plan of treatment will secure the desired results and, therefore, feel sure of the correctness of our position.

ILEOCECAL DELAY AND VAGUS REFLEX AS ETIOLOGIC FACTORS IN BRONCHIAL ASTHMA*

By J. T. Wolfe, M.D.,
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It is not my intention to dwell on the many features of bronchial asthma so well known to the profession, but to confine my attention briefly to the etiology and treatment.

Asthma is not a disease entity, but is a symptom, and the underlying cause must be found and removed or corrected in order to effect a permanent relief.

Many theories—over five hundred since the time of Hippocrates—have been advanced to establish the etiology of asthma, a few of which I shall review briefly.

Heredity has been advanced as a factor in the causation, but heredity plays a part only as several members of a family may have a defect which leads to the symptoms, and I have seen several instances where

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there were two or more cases in one immediate family.

Atmospheric conditions exercise an influence only as an irritant might to excite the irritability or hypersensitiveness of the mucosa and the nerve terminals in the bronchioles, or they may serve to bring about a catarrhal state, which in turn will increase the irritability of the bronchioles.

Pregnancy can be considered in a very minor degree, as the affliction exists in both sexes and pregnancy can cause only an increased burden upon the mother's circulatory and respiratory systems, while bringing about increased metabolic processes, with the resulting formation of increased amount of toxins.

An inflammatory condition of the eyes, ears and upper respiratory passages may extend downward into the trachea and bronchial tubes with a resulting bronchitis. Also a vasomotor disturbance in the mucosa of these regions with resulting inflammation and engorgement makes a favorable site for the lodgment of infection which may set up suppuration in the adjacent sinuses, which condition in turn causes production of more toxins and their absorption into the general system.

It has been pointed out that eczema, urticaria and psoriasis may be produced by some agent which gives rise to paroxysms of asthma. Von Noorden has called attention to the fact that individuals who in their youth suffered with stubborn attacks of these skin diseases later in life developed asthma.

Allen Eustis in the *New York Medical Journal*, May 27, 1916, says:

"Most cases are caused by absorption of proteolytic toxins, which may be absorbed from a suppurating sinus in the nose or from the intestinal canal. Treatment of intestinal toxemia is as important as drainage of focal infections."

In another paper he says:

"The writer has found evidence of autointoxication in every case of asthma examined by him for four years, leading him to believe that during the attack there is some toxic agent in the blood which acts similarly to muscarine to depress the respiratory center to such an extent that the reflex stimulation of an inflamed nasal mucosa results in a stimulation of constrictor fibers of the vagus. Nearly every one of these cases was relieved by diminished nitrogenous diet and measures to reduce toxemia."

Diphtheroid organisms have been found in sputum closely resembling morphologically those belonging to staphylococcic, streptococcic and pneumococcic groups.

Chelmonski, in 1912, described thirteen cases in which x-ray revealed the presence of swollen lymph nodes encircling the bronchi, the largest nodes in the worst cases of asthma.

Alteration of internal secretions has been suggested as the cause of toxemia resulting in asthma by producing excitability of the respiratory centers.

Anaphylaxis, or sensitization to a specific protein, was advanced by Meltzer in the September *Journal of the American Medical Association*, of 1910. While it is true that many sufferers are sensitized to certain substances, it is quite possible that this sensitivity is the result of toxins causing an irritability of the local nerve terminals, rendering them subject to irritation by certain specific proteins, and if the source of the toxins should be removed the excessive irritability would cease. Also this irritability may be due to a reflex action and if the cause of the reflex can be located and removed the effects of the protein sensitization will disappear.

I. Chanoler Walker, at the Peter Bent Brigham Hospital, Boston, has been doing considerable work on this sensitization theory in a series of six hundred cases of asthma. His working theory is based upon protein sensitivity with a sub-classification of animal emanations 16 per cent, including dandruff, horsehair, feathers, cattle hair, wool, dog hair, etc., 12 per cent to different types of food proteins; 10 per cent to bacterial proteins; 11 per cent to pollen proteins. The remaining he classified as seasonal non-sensitive and occupational. Under treatment he mentions potassium iodid, codein and adrenalin, but relies upon protein desensitization specially by feeding the protein after determining the protein by skin reaction. He decries promiscuous operations in the nose and throat for relief of this condition and says that the conscientious nose and throat specialists have learned to refrain from removing everything in their operative field as a cure for asthmatic conditions. He cites a case reported by Dr. Babcock where an asthmatic patient who had gallstones was relieved after successful operation and drainage of the gall-bladder. He

also cites a patient of his who developed a hernia and soon was troubled with asthma, but was relieved by herniotomy. The same patient developed hernia on the opposite side and again was troubled with asthma, only to be relieved upon the second successful herniotomy. He admits that climatic change is an expensive experiment and usually a poor investment.

Some authors pointed out alternating attacks of urticaria and asthma. It will be recalled that urticaria is a cutaneous manifestation of a toxemia, generally considered intestinal.

Numbers of cases of asthma have associated hay fever, but this condition is by no means present in a majority of cases of asthma. However, there is no reason why a hay fever patient may not have the underlying pathologic conditions to bring about asthma.

Morbid changes occur in the bronchial mucosa in a large percentage of cases and some observers have attributed the paroxysms to this catarrhal inflammatory swelling, but the sudden onset and disappearance preclude this theory. The writer feels that these changes may be due to disturbance of the trophic and secretory influence of the vagus nerve.

Dyspeptic asthma is a term applied to those cases where the attacks come on during the process of digestion, especially if any exertion be made at that time. This type has been cited by Dr. Max Einhorn, in the *Journal of the American Medical Association*, February, 1902, and divided into two types: those that come on immediately after eating and those that come on two or three hours after.

Dr. David I. Macht, of Baltimore, writing in the SOUTHERN MEDICAL JOURNAL in July, 1919, on the use of benzyl benzoate, says:

"Even these cases of so-called 'true asthma' are not an entity and the etiology and pathogenesis of asthma are still in a state of hopeless confusion."

Again in the same article,

"Indeed, in view of our lack of knowledge of the etiology and pathogenesis of asthma it is not at all surprising that many cases of asthma are not helped by this benzyl benzoate, as the drug acts merely as a broncho-dilator and sedative to the bronchial muscle."

He claimed 75 per cent of cases were benefited and that in some the action was very striking; in fact, only equaled by the action of adrenal chlorid subcutaneously. He claims no cures; and the best that can be made of his article is that benzyl benzoate is only a palliative to allay the spasm. Personally, I have had some alarming reactions from the administration of adrenalin and now use it only in selected cases.

E. L. Smith, in the *Medical Record*, January 29, 1907, says:

"Asthma is caused by a reflex irritation of the pneumogastric nerve which causes the muscular fibers of the bronchioles to contract. The cause of this irritation is swelling of the nasal mucosa and pressure on asthmatogenous areas. The circular muscular fibers of the small bronchioles are well developed and are controlled by the pneumogastric nerve."

Dr. Pottenger agreed with me that asthma is due to a sustained reflex condition of the vagus nerve, a state of hypertonus, and that any pathologic condition which could keep the vagus in a chronic state of irritation could cause the reflex contraction of the circular muscles in the bronchioles, admitting as factors the nose, nasal sinuses, tonsils, throat, genito-urinary organs, etc.

This brings me to the germ of my paper: that my findings during a period of ten years' study of this condition have taught me that cases of asthmatics show marked abdominal disturbances. Some cases had severe attacks of vomiting with the asthma, even to the vomiting of bile. Some had marked abdominal soreness, especially after several days' duration of the asthma. These and other phenomena led me to a close study of the abdomen in all my cases and I found practically without exception that they had more or less tenderness, especially over the entire right rectus with more or less rigidity of that muscle; that they were mostly constipated, though once in a while an individual would tend toward diarrhea; that practically all had marked enteric gas.

I had a case of a man 64 years old, an asthmatic for 20 years, who had such marked abdominal discomfort that I recommended operation, which I performed at George Washington Hospital four and one-half years ago. I found the appendix cecum and the entire ascending colon bound down with adhesions. Upon removing the appendix and freeing the cecum and ascending colon the patient made an uneventful recovery, was relieved of his asthma and has never suffered a recurrence.

About two months after his operation, his daughter, also an asthmatic, who was being troubled with enteric gas to the point of distention and who had been having severe pain in the small of the back for a period of nearly two years, consented to operation. She had had an operation and drainage for an appendiceal abscess 18 years previously and been told that the appendix had sloughed out. Believing she had a condition requiring operation she consented, and I operated upon her at George Washington Hospital and found a short stump of an appendix about three-quarters of an inch long, retroperitoneal in type. Her cecum and ascending colon were entirely bound down with adhesions and the omentum was adherent to the colon. Complete relief followed her operation, to say nothing of disappearance of pain in the back and general improvement in health.

These two cases served to convince me that this condition of adhesions of the cecum, appendix, ascending colon and in some instances the lower part of the ileum had a marked bearing on asthma from the standpoint of etiology.

My work since then has still further convinced me. For a long time I was divided between two theories: one that the delay at the cecum caused the contents to remain in the small bowel too long with resulting putrefaction and fermentation with reabsorption of toxins through the small bowel, and that these toxins circulating through the body produced irritability of the muscular fibers in the bronchioles; and the other was that irritation of the lower terminals of the pneumogastric due to these adhesions caused a reflex or chronic state of irritation in the upper terminals supplying the bronchioles, thus producing the spasm under discussion. I am rather inclined to feel that both factors enter into the symptom complex.

To freshen our memory: the pneumogastric takes origin from the floor of the fourth ventricle, leaves the cranium by the jugular foramen, runs down the neck and has branches connecting with the fifth, seventh, eleventh and twelfth nerves, supplies branches to the pharynx, muscles of deglutition, muscles of the larynx except the crico-thyroid, esophagus, heart, bronchial tubes, stomach, liver, kidneys, omentum, spleen and small and large intestines, with motion, sensation and secretion. A branch is given off from the ganglion of the root to join the petrous ganglion of the ninth nerve. The pneumogastric does not supply the tonsils, but the ninth does, also the soft palate and fauces.

I can find no authority for believing that the vagus supplies the tonsils or the genito-urinary system, so I cannot agree that a hypertonus state of the pneumogastric can be brought about through reflex from irritation in the genito-urinary tract, tonsils, nasal passages and sinuses.

In order to appreciate how any factor precipitates an attack of asthma, we must understand something of the mechanism of asthma, and I believe the most logical theory is that the small circular muscles of the bronchioles contract and constrict their lumen, thereby preventing the free passage of air through these bronchioles. Asthma is something of a convulsion of these circular muscles, and in order to obtain such a convulsive contracture, we must get a motor impulse to these muscles. It will be recalled that the vagus has motor, secretory and sensory functions, together with trophic, so it can be readily seen that a stimulus of the vagus nerve can excite any one or all of these functions. Recalling the great distribution of these nerves, it will readily be seen that any chronic irritation of them can serve to keep them in a chronic state of sensitivity or hypertonus, or exaggerated reflex, call it what you may. Just a moment's thought will recall that there are practically no usual causes along the path of the left vagus, but that the right has the gall-bladder, bile ducts, ileocecal junction, which is a site of heavy traffic, and the appendix. It can then readily be understood that the right vagus is the one which starts most of the trouble.

Disease of the gall-bladder and bile ducts; chronic inflammation of the appendix with attending irritation of the ileocecal junction and lower portion of the ascending colon, with resulting chronic peritonitis of these parts and formation of varicose veins and adhesions can readily serve to keep the right vagus in a state of hypersensitiveness so that almost any stimulus can cause the discharge of the impulses to bring about the constriction of the small circular bronchiole muscles. It can be seen readily that a heavy meal, with overburdened digestion; errors of diet (call it sensitization if you will); overexertion; excitement; indigestion with gas

formation; inspiration of dust or pollen or any local irritant to the mucosa covering the small bronchiole muscles; or an attack of acute bronchial cold or infection can precipitate the impulses in the constrictor fibers of the vagus to bring about the phenomenon which we term asthma.

We must not forget the secretory function of the vagus. Many of us have seen our patients suddenly fill up with mucus without warning and a wild, frightened expression seize them. On the other hand, the motor function may predominate for days and we will see dry asthma with no secretion, relief coming only when the cough develops and the patient can begin to raise mucus and expectorate. Lack of time and space forbid me from enlarging upon the clinical picture which many of us have often seen, than which there is none more pitiful.

From the above we can draw a simple illustration, "That a gun cannot be fired unless it is loaded." Remove the load from the gun and you can pull the trigger at will and no discharge will take place. So it is with the vagus. The convulsion cannot be precipitated through its terminals if the nerve is not subject to some exciting influence, and in a state of hypertonus or exaggerated reflex ready to respond to one or any or all of the above named exciting factors. Then the logical thing to do is to remove the cause that is keeping the vagus loaded and ready to be discharged by finding that chronic exciting factor and removing it.

Looking back over my cases prior to the discovery of the abdominal condition, I can readily understand why some of them had such prominent digestive disturbances. I shall report a few of them.

C. C., a male, age about 36, lived an outdoor life in the mountains and had chronic asthma with severe paroxysms of very intense nature. He was well developed physically, but sensitized to banana protein, as a slice one-fourth of an inch thick would precipitate an attack. He was operated upon for an abdominal condition about June 1, 1919, and has had very little trouble since. He states that he can eat half a dozen bananas without precipitating an attack.

J. A., a female, extremely emaciated, was 5 feet 9 inches tall and weighed 93 pounds. She had had asthma for 20 years constantly and chronic pleurisy on the right side with pain and constant cough. She was sensitized to egg and had chronic albuminuria. She was operated upon September 15, 1920, and extensive adhesions, etc., were found. She is gaining in weight, the pleurisy is about gone, and she sleeps all night. She coughs very little and is gradually improving. She eats eggs *ad lib.* and the urine is clear of albumin.

J. A., a male, 11 years old, had had chronic asthma for 8 years. He weighed 50 pounds. He was operated upon August 21, 1920, and extensive adhesions and enlarged glands up the ascending colon were found. He gained 10 pounds the first week after leaving the hospital, above the pre-operative weight. His body is building up and gradually getting free from asthma.

G. R., a male, aged 36, was operated upon September 27, 1920. He had been always troubled with a cough and more or less pleurisy on the right side. He was very thin and run down. He had had digestive disturbances and chronic albuminuria. Since operation the cough is gone and what sibili he had have disappeared. He is gaining weight and doing finely. He has no albuminuria at the present time.

A. B. R. was a river man, aged 49, and only fairly nourished. He had had chronic asthma 10 years and could work only part of the time. He was operated upon August 31, 1920. He had a chronic adherent atrophied retrocecal appendix and massive adhesions of the cecum, ascending colon and hepatic flexure. He has had a few mild attacks since operation, but says he could lie down in them. He is practically free now of asthma and the stethoscope shows no sibili.

W. C. C. was a male, aged 34, who had had severe attacks of asthma for about 9 years. Four physicians in his family brought a prominent surgeon into the case, who insisted on the gridiron incision. I could remove appendix, but could not free adhesions. The case was improved, but not a success.

I could site more, as I have had a series of seventy-five cases of asthmatics of varying stages, 33 1-3 per cent of whom have been operated upon with such satisfactory results that I feel justified in continuing the work upon those who do not respond satisfactorily to medical treatment. Medical treatment consists largely in correcting, as far as possible, the errors of digestion and the use of such expectorants and vaccines as will correct the secondary bronchitis.

A review of my cases convinces me that a number of the so-called "protein-sensitive" patients were sensitized only inasmuch as they had derangements within the abdomen, and also that many of the cases I treated before beginning to operate were suffering with the same condition.

The length of time for complete recovery following operation to release the cecum, colon and omentum from adhesions,

varies. I usually tell my patients that they must not expect complete relief from asthma under a year, that it takes a certain length of time to repair the diseased condition of the bronchial tubes and to outgrow the habit of spasm in the muscles of the bronchioles. Those cases that continue the attacks following release of adhesions gradually improve in that the attacks get lighter and further apart, though I have had a number of cases that never had a recurrence following the operation. Several of these patients had had their tonsils removed, septums straightened, etc., to say nothing of climatic changes and such treatment as they could get. I am fully convinced that there is some basic fundamental pathologic condition behind this protein sensitization theory such as I have described, and treating the sensitivity is treating the symptom and not the disease.

The operation consists of opening the abdomen by means of an overlapping right rectus incision parallel to the median line one inch from the outer margin of the rectus. The skin is divided, then the sheath of the rectus immediately beneath the skin incision. The rectus is freed from the outer portion of its sheath and retracted toward the median line. The peritoneum being thus exposed directly beneath the skin incision is opened and the ascending colon located and traced to the appendix. Appendix, cecum and ascending colon are usually bound by adhesions, but some cases show only a chronic dirty appendix that is not adherent, while the adhesions may begin at the upper portion of the cecum. The omentum has usually become bound to the colon by web-like adhesions and the collateral circulation between the omentum and colon is well established, large tortuous veins of a varicose type being present. In some cases the bowel is so bound that it is completely enveloped by adhesions. The omentum is freed from the colon up to the hepatic flexure and the bleeding points are all tied off with plain gut, step by step. The colon, which has been bound down, upon being released immediately balloons considerably, as it has not been in the habit of employing its circular muscle fibers. After removing the appendix and freeing the adhesions the incision is closed.

For ten years I have been employing slow distending enemas daily to distend the colon, following abdominal operations, to prevent the colon from being bound again by adhesions. Under this method no case has given trouble with adhesions following operation. Also I refrain from feeding the patient till the third or fourth day, as introduction of food seems to serve only to promote the formation of gas and distress for the patient, as the digestive function is practically paralyzed following laparotomy for any cause.

The follow-up of these cases, after convalescence from operation, where there has been marked change in bronchial tubes and lungs and pleura is important, as the old, long-standing bronchitis has to be cleared up to obtain perfect relief.

It will be seen, if my hypothesis is well taken, that asthma can be relieved by locating and removing the cause of the hypertonic state of the vagus nerve. I do not claim that adhesions such as I have described and the resulting chronic peritonitis are the only cause of this hypertonus, for I feel there are other conditions along the path of this nerve that might arise, but I do believe that a majority of such pathologic factors will be found within the peritoneal cavity and that the adhesions above described will constitute a large majority of these intra-peritoneal conditions. Also the production of intestinal toxemia must always be considered as a factor in keeping the patient's health below par.

DISCUSSION

Dr. W. W. Duke, Kansas City, Mo.—Real asthma, excluding cardio-renal asthma, emphysema, enlarged thymus, etc., is due to a congenital state which permits an individual to become sensitive to some foreign substance. Once sensitive the individual is likely to have asthma whenever he comes in contact with the substance to which he is sensitive.

I can readily conceive that abnormality in the intestinal tract or its appendages might predispose to the absorption of partly digested substances which could sensitize a susceptible individual, and that thereafter the absorption of such products could produce asthma. I can also readily conceive that correction of defects of this sort might change the nature of digestion or putrefaction and in this way eliminate the elaboration of the substance which was damaging to the patient.

Some years ago I reported a number of cases of abdominal pain due to hypersensitiveness to foods, such as honey, shad roe, egg, etc., and in these patients found a serious lesion in the abdomen in over half of the cases. In several of these partial relief of the hypersensitive state was obtained by surgical correction of the lesion found. For example, one patient invariably had severe abdominal pain following the ingestion of milk or lactalbumin. The same pain could be reproduced by subcutaneous injection of lactalbumin. The patient was found to have gall-stones; and following the removal of gall-stones could drink a certain amount of milk without discomfort.

Reflexes through the vagus unquestionably add to the symptoms caused by hypersensitiveness to foreign substances. It is well known that asthma due to pollen sensitiveness, for instance, may be either made worse or relieved by such reflexes as those caused by evacuation of the bowels by emetics or vomiting, by the ingestion of food, by the inhalation of cold air, etc. Such reflex factors, however, I believe are purely secondary. While they are important, they sink into insignificance in comparison with the primary source of asthma, namely, hypersensitiveness to foreign matter.

Dr. Sydney R. Miller, Baltimore, Md.—Dr. Wolfe is right in saying that in all likelihood asthma is a symptom rather than an entity. That its causes may be multiple no one can doubt.

Despite the advancement of some four or five hundred theories about asthma, we had no concrete knowledge about its mechanism until Meltzer's work came out some eight or ten years ago. In the study of anaphylaxis he observed that certain phenomena were analogous to the condition clinically known as asthma. Work was started along that line which has developed very successfully since, and the burden of proof is now upon those who do not subscribe to the allergic theory of this condition. It has been shown beyond much question of doubt that in most instances the state of hypersensitiveness is a factor inherited in accordance with certain laws laid down by Mendel.

I cannot possibly agree with the point of view which Dr. Wolfe advances: that asthma results from the effect of adhesions somewhere around the cecum, demanding primarily surgical intervention. It would require a great deal of stretching of my imagination to believe that such a condition as this would explain attacks of asthma which follow within a few minutes after exposure to, ingestion of, or contact with specific proteins. It could hardly explain the asthma which develops in the early years of childhood, following the first ingestion, for instance, of egg white. It is rather difficult to believe that a patient who suffers from asthma only at one season of the year when exposed, for instance, to ragweed pollen or when brought in contact with animal emanations, has this reaction as a result of some intestinal toxemia; nor is it easy to believe in the wisdom of advising an operation for such a patient with the expectation that adhesions loosened will prevent subsequent attacks of pollen or animal asthma. Whatever we may think about asthma, we may as well be honest and admit that we know relatively little about it. It is our experience in Baltimore that many showing a specific protein factor can be cured either by desensitization or by persistent avoidance of the article which induces the attacks. Many cases seem to improve after the utilization of justified surgery, such as the removal of bad teeth, tonsils, or the clearing out of infected sinuses. But the vast majority of such cases tend sooner or later to manifest again their asthmatic symptoms. I should be loath to have many patients operated upon under the inducement that an abdominal operation would have any particular benefit.

Dr. A. L. Levin, New Orleans, La.—Widal, after experimenting for a number of years, demonstrated that if a protein which is not chemically well disintegrated enters the portal circulation and the liver does not arrest it, there is a crisis expressed by a leucopenia, a fall in blood pressure and a change in the coagulation time. I took up this matter and those observations I shall explain in detail when I read my paper tomorrow morning. I have studied a number of cases representing various groups, among which is a group of asthmatics.

A case of asthma during an attack was referred from the medical clinic to our service with gastric symptoms. He gave a decided leucopenia after protein ingestion. Widal has demonstrated in cases of that type and of other types that there is a disturbed liver function. We can immunize them in from twenty minutes to half an hour before the protein meal is given by small quantities of panopepton in one-half or one-ounce doses. In cases of asthma it was interesting to observe that after a disturbed proteopexic function of the liver was corrected they improved. Evidently Widal is right.

Other observers claim that we find albumoses and peptons crossing the gastric and intestinal mucosa before they are changed to the stage of amino-acid; and that if we improve the chemical breaking up of the substances before they go into the portal circulation we may relieve the liver of great embarrassment. In my experience, as a rule, we find in asthma cases a low hydrochloric acid content. They often have biliary disturbances when they take protein; the protein is absorbed from the mucous membrane into the portal circulation before it is chemically prepared for it, and disturbances result. I have put these patients on hydrochloric acid after meals and pepton half an hour before meals, and in less than thirty-six hours the attacks of phenomena have disappeared.

Dr. E. C. Thrash, Atlanta, Ga.—Asthma is a symptom-complex arising from multitudinous causes, many of which we know nothing about. It arises frequently from hypersensitiveness to flora of the respiratory system. The proteins of these flora are undoubtedly the cause of more of the asthmas than all other causes of which we know.

The next most common causes of which we know are those resulting from faulty metabolism. This metabolic disturbance arises chiefly from disease processes which set free toxins into the circulatory system, such as the various kidney dis-

turbances, cardio-renal complexes and endogenous intoxications.

It is beginning to dawn upon us now that the disturbances of the internal secretions have something to do with asthmas, but we have made little progress in obtaining definite knowledge of their exact relations.

As one of the feeble sources of asthma, I would think of intestinal disturbances of all kinds.

It has been shown conclusively that bacteria, food, pollen and other protein sensitization are the most common causes of asthma, and we have accomplished much in the way of relieving these disturbances with desensitization by inoculation of the proteins.

I have obtained poor results from food protein desensitization, but have succeeded in desensitizing with pollen proteins and the bacterial content normally found in the respiratory tract.

Dr. Allan Eustis, New Orleans, La.—When we speak of serum sickness we say nothing but that there is a toxemia. There is a proteolytic toxin or toxins liberated in the circulation in this condition and it is possible that analogous proteolytic toxins can be absorbed from the intestinal canal.

A large number of hay-fever cases in which there is no definite anaphylaxis or protein sensitization may be greatly relieved by overcoming the intestinal toxemia. They will often go through a whole season if watched carefully for absorption of intestinal toxins without an attack.

My experience in intestinal toxemia does not coincide with the views that have been expressed by Dr. Wolfe. In a series of 350 cases there were only 2 in which I found it necessary to resort to surgery to overcome the intestinal toxemia. Most cases of intestinal toxemia can be overcome by dietetic and hygienic measures without resorting to surgery.

Dr. Wolfe (closing).—In the discussion no one spoke of the mechanism of asthma. There must be contraction of the bronchial muscles, and for that there must be a direct stimulus of the muscles or a nerve impulse. You can bring this about by local irritation or by absorption of proteolytic toxins after hypodermic inoculation. We know that a certain substance circulating through the system will either excite nervous impulse of a muscle or locally irritate the muscle when it gets to it. I do not know which it does.

Protein sensitivity excites something that brings about this mechanism, whether it does it in the circulation by direct contact or by irritating the vagus nerve, thereby contracting the fine bronchioles.

Sanborn in a series of 800 cases observed at the Mayo Clinic reports 500 that were absolutely negative to protein sensitization. One hundred doubtful, while 200 cases were positive.

Has any one ever done a series of 800 protein inoculations on normal individuals? We should probably get 25 per cent reactions by any skin inoculation, even some by salt solution.

Of course, we all dislike to see patients operated upon. I said in my paper two years ago that I operated upon one-third of my cases. Since then my ratio has markedly decreased.

Deep abdominal massage is one of the most valuable factors in the treatment of these cases. Outdoor exercise has been emphasized, but I find deep massage over the entire abdomen and especially over the ileocecal junction, toning up the intestinal muscles so that the patient eructates gas, very valuable treatment. Some patients begin to eructate as soon as I commence massage. It tones up the abdominal muscles which have become so relaxed that they have ceased to perform their function properly. In the operation, the bowel is frequently found bound down so that in releasing the adhesions it balloons out, which shows that its circular fibers have been practically paralyzed owing to long disuse.

In regard to the time of recovery following operation, it takes a certain amount of time to repair the human body after the removal of a chronic infection or anything else. In some cases we may have a purely functional disturbance to deal with.

Dr. Levin spoke of the fact that proteins may enter the portal circulation in a raw or semi-digested state, and stimulate the bronchiole muscles to contract, thereby producing asthma. After my operation and restoration of the digestive function the patients split up the proteins and they no longer enter the portal circulation in a raw state. If they are injected under the skin they can still irritate the bronchial muscles, as they enter raw.

The digestion has been markedly improved in all these cases, and every one is living. The second case I reported, the daughter of the first case, gained from 95 to 160 pounds, showing the general improvement in her condition. You improve these cases if you improve their digestions.

Dr. Thrash said that asthma is a symptom-complex, with multitudinous causes. That has been brought out in many instances, but all these causes simply precipitate the mechanism of asthma. I operated upon a man who was sensitized to milk chocolate. I found slight adhesions, a definite Lane's kink and a true angulation of the ileum as it entered the cecum. Within a month after operation he carried a bag of chocolates in his pocket and ate them on the street. His digestion was completely restored.

MALARIA IN CHILDREN AND THE ABUSE OF QUININ*

By Eugene Rosamond, A.B., M.D.,
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It is the custom of physicians in the Mississippi Delta, especially in the smaller towns and in the rural districts, to give quinin to all patients they see during the malarial season. This practice finds justification in the argument that waiting for a laboratory report from a distant city, or even waiting to carry a blood slide back to their own offices, finding the time to examine it, and then getting the report, the medicine and the instructions back to the patient who, perhaps, lives miles away, would needlessly sacrifice many lives.

Again, it is practically impossible for most country practitioners, busy perhaps sixteen hours in each twenty-four, to examine promptly the large number of blood slides they might collect in a day's work, even if they possessed the requisite skill with stains and microscope.

The establishment of district laboratories by the various state boards of health, the building of good roads and the automobile are rapidly bringing the necessary laboratory aids to the country doctor. But the problem of time still remains, and so for a while longer we can find no criticism of the promiscuous giving of quinin, provided it is given by mouth and in physiological doses, and must endorse it on its record of lives saved.

But to us as specialists, living in the larger towns and equipped to make differential diagnoses, there can be no justification for the "therapeutic diagnosis" of a disease whose presence or absence the laboratory can determine with certainty.

Despite various text book statements to the contrary, the opinion prevails among a majority of our better informed physicians that the percentage of positive laboratory findings is low as compared with the actual number of malarial infections. To determine the accuracy of these opinions, I examined the records of 300 cases of malaria treated at the General Hospital of the City of Memphis with the following results:

No. of cases	300
No. of cases in which parasites were found	291
No. of cases in which parasites were not found	9
Percentage of positive findings	97
No. of aestivo-autumnal infections	150
No. of tertian infections	141
Spleen palpable in	142 cases
Spleen not palpable in	158 cases

In the nine cases where the parasites were not found, all had had quinin previous to the blood examination.

These examinations were made under the supervision of Dr. William Krauss, Director of the Laboratory for Field Investigation of Malaria, U.S.P.H.S., who, by courtesy, is doing this work for the University of Tennessee, for Memphis physicians, and for west Tennessee.

Of course, we must take into consideration that the hospital case is a case of heavy infection, but even so, this result shows that the blood test for malaria is more reliable than is the Wassermann test for syphilis, and we do not give arsphenamin on a negative laboratory report.

In our children's clinic, which handles over 1500 private patients monthly, many of them coming from various sections of the Delta, all cases of proven malaria (and no child is given quinin unless the parasite is found) have been carefully tabulated as to mode of onset, symptoms, duration of fever, dosage of quinin, number of relapses, etc., and in a series of 100 cases studied, ranging from 17 days to 15 years, we have reached the conclusion that malaria in childhood presents no special problem either in symptoms, clinical course or in response to treatment. Malaria is malaria. The incidence of age has nothing to do with it except that the protective organism of the child is inferior to that of the adult and responds more violently to toxines, so that convulsions in children often replace the chill of the adult, just as is the case in any acute infection.

Malaria may of course simulate almost any disease, but so may typhoid fever, and unless its course has been modified by the administration of quinin it usually runs as true to form as any infection we see.

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Because of the inferior protective organism of the child, phagocytosis by the endothelial cells of the capillaries and by the large mononuclear cells is lessened and the parasites are perhaps easier to find.

Sporulization occurs about one to two hours before the onset of the chill, so that blood taken just before chill time must be searched more carefully in order to find the parasite. The greater number of parasites are perhaps found in the peripheral blood during the sweating stage, when the skin is relaxed and the capillaries are flushed with blood.

Provocative doses of adrenalin may flush the parasite out of the bone marrow and deep organs.

Hereditary transmission of malaria does not take place. Most observers agree that prenatal infection does not occur.

A few cases of malaria in very young infants have been reported. Mannaberg (L1) gives the incubation period of malaria, which would vary with the number of sporozites introduced into the blood, as from six to twenty-one days. The youngest case I have ever seen was 17 days old. This, I wish to record here:

Baby H., white, female, age 19 days, was brought to my office from the Mississippi River bottoms of Crittenden County, Arkansas, in May, 1922, for high fever which had lasted two days, or since the child was 17 days old. The baby weighed seven pounds. Physical examination was negative, but a routine examination of the blood revealed tertian parasites in great numbers and in different stages of development. The temperature was 105° F., but the child had had no convulsions. The mother had chills before and after the birth of the baby, and the baby had been bitten by mosquitoes every day of its life. Recovery was prompt and uneventful. The patient and the blood was shown to several colleagues.

There is absolutely no truth in the popular idea that malaria tends to recur on the seventh, fourteenth, and twenty-first days.

The administration of quinin to children should be by mouth except in pernicious cases where the patient's life is in immediate danger. Here intravenous dosage is permissible, but only for the immediate crisis. The best method of administration is by capsule or tablet to older children, and in aromatic syrup of yerba santa or syrup juvans to younger children and babies.

(1) Bass' objection to quinin in solution on the grounds that such unnecessarily unpleasant doses will not be taken for a full and necessary period of eight weeks seems to me to be absolutely correct.

The 24-hour dosage may be estimated as ¼ grain for each pound of weight, or ¼ grain for each year of age.

(2) Bass calculates from his work in Bolivar County, Mississippi, that the doses necessary to disinfect children are as follows: under 1 year, ½ grain; 1 year, 1 grain; 2 years, 2 grains; 3 and 4 years, 3 grains; 5, 6 and 7 years, 4 grains; 8, 9 and 10 years, 6 grains; 11, 12, 13 and 14 years, 8 grains; 15 years and older, 10 grains.

These should be repeated about every 8 hours. Larger doses are no more efficient and may do harm to the patient.

The intramuscular injection of quinin is of such questionable value and is fraught with so much danger of injury to the tissues that I believe it will ultimately be abandoned.

The popularity of the intravenous use of quinin is truly alarming when we consider the crude methods of its administration and the absolute certainty of the relapse of the patient who is given only a few doses. I have been told by numbers of physicians that they gave "one shot and that was the end of it."

The intravenous injection of quinin is a dangerous procedure which may cause the death of the patient. Circulatory depression, nervous phenomena of various sorts, including paralyses, injury to sight and hearing, rapid fall of temperature by concentration of blood sugar, venous thrombosis, and where accidental extravasation occurs local necrosis and sloughing, are untoward results not to be lightly considered. Moreover, it has recently been shown that malaria is not more readily cured by intravenous medication.[3] Ninety per cent of the quinin injected intravenously disappears from the blood and is stored in the tissues in one minute.[4]

Acton,[5] in the *Lancet* for June, 1920, reports 100 cases treated intravenously

and orally for 8 weeks with 18 per cent of cures, while 190 cases treated orally with 30 grains daily for ten days gave 42 per cent of cures.

These results may be multiplied indefinitely. It is the overwhelming opinion of the literature—over 100 reports—that intravenous quinin makes the tissues quinin resistant.

This is the crux of the whole matter, and it applies especially to the child with his imperfect protective organism. His tissues become more easily quinin resistant. Intravenous quinin controls the clinical symptoms for the time being, but it retards and hinders his recovery.

To obtain the ideal results, "leaving unscathed the protoplasm of the host," we must sneak in, so to speak, our medication.

There is no stage in the life cycle of the parasite at which it is most readily destroyed by quinin, popular opinion notwithstanding. The time to give quinin is when the disease is diagnosed. The young parasite is not hatched out into a drug-filled and antiseptic blood where he meets death. Normal blood plasma destroys the parasite very quickly. Quinin increases the permeability of the red cell and allows the plasma to reach the parasite.

Treatment must be continued for a period of 8 weeks if we would prevent relapse, and the daily dose should be the same as that required to kill parasites during the acute stage.

The giving of quinin in the gastro-enteric disorders of hot weather, especially the giving of quinin in syrupy and chocolate mixtures to very young infants in conditions in which sugars are contra-indicated, constitute by far the most frequent instances of abuse of the drug which we as pediatrists see.

A majority of our referred cases of intestinal intoxications and infections present nervous symptoms, including vomiting, which are taken as indications of cerebral or meningeal irritation, which clear up on water, rest and food.

Are not these symptoms many times due to cinchonization?

During the past summer the author treated 5 cases received during one month and treated simultaneously in the Children's Ward of the Baptist Hospital, which follow:

Case I.—Baby McC., age 2½ years, breast fed, and never before had been ill. Three days previously it became sick with fever and frequent foul-smelling stools. On admission to the Hospital it was vomiting frequently, rolling its head continuously when aroused, and then lapsing into stupor. Temperature was 101° F.; pulse, 158; and skin cool and mottled in appearance. The blood showed polymorphonuclears, 52 per cent; large mononuclears, 10 per cent; small mononuclears, 38 per cent. Malaria was not found. The urine contained blood and albumin, but no casts. Stools, 1 to 4 daily, foul and full of mucus. There were indurations in the arms and hips from hypodermics of quinin. Quinin had also been given by mouth, but the amount could not be determined. The baby was dehydrated and very sick looking. Three hundred cubic centimeters of 2 per cent bicarbonate of soda was given intraperitoneally and water pushed by mouth all night, though this was vomited frequently. A dose of milk of magnesia was retained. Next morning barley water and dextri-maltose was given and retained. At that time it was discovered that the child was blind. Vision was found to appear and disappear throughout the next three days. The eye grounds showed nothing, though an expert did not examine them. Lactic acid milk was added to the malt sugar and barley and on the fifth day cereals, broths, etc.; and on that day the child was allowed to leave the Hospital.

Case II.—Baby M., male, white, age 9 months, was breast fed. He had been ill for 60 days with temperature running very high and after several days dropping to normal. At one time it had stayed normal one week. He had been treated for malarial fever and had received quinin grs. iv by mouth daily with additional quinin added to the mixture, besides various hypodermics of quinin. One day he received gr. xx, which produced collapse and coma, and it was thought the baby was dead. He had been breast fed entirely and was nursing every 15 to 30 minutes from a flabby breast and a frantic mother. His weight was 16 lbs. 2 ozs. on admission to the hospital. Temperature was 99° F., running up to 103° F. in four hours. The baby was in an extreme condition of acute inanition and was dehydrated. The skin lay in folds over the muscles and was devoid of all elasticity. The eyes were sunken. The child was irritable, vomiting and refused to eat. Three hundred cubic centimeters of Ringer's solution was given intraperitoneally, and two hours later condensed milk was forced with a spoon. Three hundred and fifty cubic centimeters of normal saline was given in the abdomen 12 hours later. The condensed milk was fed at three-hour intervals for 24 hours and then the baby was put on the breast and lactic acid milk with 5 per cent dextri-maltose given complementally. He left the hospital on the sixth day, having gained one

pound. This baby had been given the equivalent of 150 grains adult dose of quinin.

Case III.—Baby S. P., white, female, age 17 months, was breast fed. She had become ill 2½ months previously with pertussis, ran a temperature of 99 to 100° F. Ten days previously she had a rise of fever and a convulsion. Quinin was given every three hours day and night, a teaspoonful of cocoa-quinin with powdered quinin stirred in each dose. It is estimated that she received 30 grains daily. The child entered the hospital with a temperature of 104° F., was very restless and irritable, semi-delirious, rolling her head and was vomiting. The blood showed 23,900 leucocytes, 65% of which were polymorphonuclears. The urine showed numerous pus cells with clumping and motile bacilli in a sterile catheterized specimen. The lungs showed increased peri-bronchial markings by x-ray. Water was pushed by mouth and potassium citrate was given. The temperature dropped and the nervous symptoms rapidly cleared up. This child received an estimated adult dose of 180 grains of quinin daily.

Case IV.—S. H., white, a female, had had pyelitis four years previously. She had been ill for one week with a chilly sensation which had been followed by a rise of fever which preceded a heavy sweat. These chills occurred about every 6 hours. She had had 7 hypodermics of quinin dihydrochlorid in the previous 8 days and gr. iiiss by mouth every four hours, day and night. She was in a pitiable state of fright and nervousness, was restless, with her head rolling, and she had disturbed vision and tinnitus. The blood showed 10,000 leucocytes, 45 per cent of which were polymorphonuclears, and there was no malaria. The urine was loaded with pus. The child recovered promptly on water and alkalis. The estimated equivalent of the adult dose of quinin was 60 grains daily.

Case V.—Baby W., age 11 months, weight 15 lbs. 15 ozs., was breast fed. It had been sick for eight weeks with fever. It had been taking quinin gr. xvi-xx daily. It had constipation, vomiting, cried continuously, rolled her head, nursed every few minutes and vomited. Temperature 102° F., loss of turgor, dehydrated, pulse 130, respiration 26, liver enlarged, and spleen not palpable.

It was given 400 c. c. of 2 per cent soda bicarbonate intraperitoneally; its stomach was washed and it was fed by lavage lactic acid milk with 3 per cent dextri-maltose. Atropin was given before feedings. It was dismissed in eight days, gaining in weight. The daily dose of quinin given for eight weeks was the adult equivalent of 120 grains daily.

Five cases referred to one man at one and the same time, where quinin overdosage had influenced the clinical course of the disease, is not a mere coincidence.

I believe that careful histories will show that most of our hospital cases of gastro-intestinal derangements have been taking overdoses of quinin, given in chocolate and other flavored syrups, menstrua that in health are considered dangerous to infants in such quantities.

This statement is not made as a criticism of the country physician. The differential diagnosis of intestinal intoxication and malaria is the one we are most frequently called upon to make. In a malarious district and without a microscope, what would you do?

CONCLUSIONS

The laboratory test for malaria, if conscientiously and persistently carried out, is reliable in practically 100 per cent of cases.

The incidence of age does not affect the clinical course of malaria.

The abuse of quinin in its overdosage to children is almost universal throughout the South.

The giving of quinin in sugary syrups to infants and children with gastro-intestinal diseases may aggravate the existing condition.

The giving of overdoses of quinin may account for many nervous phenomena not otherwise explicable.

Madison Ave. at Somerville St.

REFERENCES

1. Mannaberg, Julins: Nothnogel's Encyclopedia of Practical Medicine. W. B. Saunders & Co., Philadelphia, 1905.
2. Bass, Chas. C.: Tice's Practice of Medicine. W. F. Prior Co., New York, 1921.
3. Lane, Clayton: Malaria, a Critical Review. Trop. Dis. Bul., 19:93, 1922.
4. Ramsden, W., Lipkin, I. J., and Whitley, E.: Ann. Trop. Med., and Parasitol, 12, 283, October, 1918.
5. Acton: Lancet, June, 1920.

DISCUSSION

Dr. J. O. Elrod, Forsyth, Ga.—I am not from a malarial section, so I have not had very much experience with it. I feel as Dr. Rosamond does, that in cases where there is not a laboratory accessible, it is erring on the right side rather than on the wrong to give a therapeutic dose of quinin to these children. If we have laboratories more accessible, it is a great deal better to use them than to fill the children's stomachs with quinin.

Dr. W. A. Mulherin, Augusta, Ga.—I was interested in Dr. Rosamond's paper for the reason it expresses directly opposite views to those entertained by me as regards malaria in infancy. This year at the St. Louis meeting of the Pediatric Section of the American Medical Association I presented a paper on this subject. My observations and deductions were drawn from 300 to 400 private cases and from 50 closely studied cases of malaria in infancy and early childhood. The following differences between

malaria in infants and the disease in adults appeared to me to exist:

Afebrile Malaria.—With a history of no preceding febrile onset, a fair number of babies, breast fed, receiving plenty of breast milk, and with the blood showing malaria parasites, will run no fever, grow indifferent to nursing, stop gaining in weight, or lose slightly, and grow decidedly anemic. This condition may have existed for three or four weeks before medical advice is sought and the blood examined. Physical examination will result in absolutely negative findings in fully 30 per cent of cases, with no enlargement of the spleen and nothing to guide one to diagnosis from the clinical picture except the marked anemia.

Periodicity and Fever.—The medical mind rightly believes periodicity in clinical manifestations to be the most characteristic feature in malaria. This is true of malaria in the adult, and in children after three years of age. In Georgia—and I believe the same applies to the South in general—periodicity in subjective and objective symptoms of malaria in infancy is oftener absent than present. The younger the patient, the less frequently is periodicity found. Fever is remittent, irregularly intermittent or absent more frequently than regularly intermittent. This is not due to a preponderance of estivo-autumnal infection, but is seen in tertian infection. In and around Augusta, Ga., where my observations were made, tertian infection predominates over estivo-autumnal in the ratio of about three to one.

Probably the explanation for absence of characteristic fever in infancy may be found in the blood picture of tertian infection in the infant. Here all stages of development in the tertian infection are seen, more often than in the adult. The forty-eight-hour cycle of maturity of plasmodia in the infant's blood is probably not completed with the same regularity or periodicity as occurs in the adult. The host may account for the difference in cyclic development. Clinically, we know babies react differently from adults to infections of rheumatism, typhoid and pneumonia.

With the cycle of maturity more continuous, or more irregular than periodic, remittent and irregularly intermittent, rather than regularly intermittent, fever would be expected. The same frequent absence of chills, or its equivalent in babies (cold hands and feet, blue lips and nails, slight cyanosis or pallor, drowsiness or prostration) would somewhat substantiate this assumption.

Digestive Symptoms.—In infancy, gastric and intestinal disturbances are not uncommon symptoms in the early stages of malaria; vomiting in about 75 per cent and mild diarrhea (sometimes ileocolitis) in 25 per cent would be, I believe, a fair estimate. In general, it might be said that malaria is a great disturber of the normal functioning of the body of the infant and the very young child. If the child possesses latent tetany or a tendency to asthma or bronchitis, malaria will frequently excite these conditions to activity and give a varied clinical picture.

Enlargement of Spleen.—In adults, a palpable spleen, under careful examination, is, in the early days of malaria, a rather constant finding. In infancy, and up to three years of age, a palpable spleen is absent in fully 30 per cent of cases in the first week of illness. In a goodly number the spleen is not palpable throughout the entire malarial attack.

A word about standard treatment. I do not understand how Dr. Rosamond, Dr. Bass, or any other physician can say when a case of malaria is cured. By cure I mean thorough eradication of malarial organisms from the system. We know the tissues of the body can, and do, harbor malarial parasites for years. We further know that no amount of quinin given during an attack or subsequently will kill the plasmodia in the tissues. The only plasmodia killed by quinin are those in the circulating blood. A case cited by Dr. Gengenback, of Denver, Colo., at the St. Louis meeting above referred to illustrates this point. A Southern mother lived in Denver continuously for three years before the birth of her baby. The baby when three weeks old developed fever that baffled the Denver physicians. The blood was examined and malarial organisms were found. Quinin promptly cured the child. In Denver they have no mosquitoes. The baby had never been away from Denver, nor had the mother for three years. The mother's tissues must have harbored malarial organisms for at least three years. There had been no symptoms of malaria present in the mother, while living in Denver.

As to the practice of no plasmodia found, no quinin should be given, I cannot say I am in thorough accord on this point. We realize that the average physician, generally speaking, makes one blood examination and also that we do not secure 100 per cent positive findings. Therefore, when scientific methods have been applied to a case and have proven negative, and the clinical picture of malaria exists, the therapeutic test is not only advisable but mandatory. It should be remembered that we not only have science to subserve, but we also have a patient to treat. In short, my idea of the correct treatment of malaria is scientific treatment plus brains.

Dr. Rosamond (closing).—I do not believe that Dr. Gengenbach's case was malaria.

Dr. Mulherin.—It was found in the blood.

Dr. Rosamond.—There is no other case on record, so I would accept this one with reservations in view of the millions of babies born in malarial countries and the thousands of competent observers who have spent years looking for the opportunity to be the first to present such a case. Theoretically, if enough mosquitoes could bite a baby shortly after birth it might develop malaria in forty-eight hours' time, but it would take millions of bites.

Dr. Mulherin.—The mother conveyed it to the child through the blood.

Dr. Rosamond.—Then it is the only case on record. I would accept it with a grain of salt because it has not been accorded the place in the literature due so remarkable a case. Malarial investigators do not believe placental transmission possible.

A FAMILY GROUP OF TYPHOID SIMULATING MENINGITIS*

By Harvey G. Beck, M.D.,
and
Ferdinand A. Ries, M.D.,
Baltimore, Md.

On October 21, 1921, R. J., a colored boy, aged 14 years, was admitted to our service at the Mercy Hospital. He presented all the characteristic symptoms of typical cerebrospinal meningitis. The spinal fluid, blood cultures and Widal reaction were repeatedly negative. Before his cerebrospinal symptoms subsided his brother, J. J., aged 5 years, was admitted, on November 12. The mode of onset, clinical symptoms and laboratory findings were almost identical, and they both developed bronchopneumonia while in the Hospital.

The following day, November 13, the third brother, M. J., aged 12 years, was admitted. He also had meningeal symptoms, namely, intense headache, photophobia, disturbance of speech and facial paralysis; but the constitutional symptoms were not so pronounced. A history was obtained that the father, who lived on a small farm, was sick several months previously with a fever, which was suspected to be typhoid.

The following is a brief report of these three cases:

Case I.—R. J., aged 14 years, began to complain on October 5 (sixteen days prior to admission) of headache, stiffness of the neck, huskiness of the voice, malaise, anorexia and cough. On the day of his admission his nose bled and he developed a delirium and stupor. He continually groaned and could not be aroused. Subsultus tendinum was present. His temperature was 105.8°, pulse 120, and respiration 30. The eyes were staring; pupils sluggish and photophobia marked. Herpes appeared on the lips. The head was retracted, and there was great rigidity of the muscles of the neck. On examination of the chest, signs of a bronchopneumonia were revealed. Heart action was rapid and the valvular sounds were normal. The spleen was not palpable, although the area of splenic dullness was slightly increased. Brudzinski's and Kernig's signs were positive. Blood cultures were persistently negative. Repeated agglutination tests were negative until after the end of the febrile period, when a positive reaction to the typhoid bacillus was obtained. Typhoid bacilli were isolated from the stool. Numerous blood counts showed a moderate grade of anemia with a hemoglobin of 70 to 75 per cent and an average red count of 3,990,000. The white cells ranged from 4100 to 7200. The differential showed a low polymorphonuclear count ranging from 34 to 57 per cent, small mononuclears from 37 to 61 per cent and large mononuclears from 2 to 5 per cent.

A coarse tremor of the right side of the face, including the upper lip, developed three days after admission. This persisted for about one week. At the same time he developed a positive Babinski sign on the right side and a catatonic state of the muscles, especially those of the arms. Two days later, when the stupor cleared up, photophobia became so intense that the fundi could be examined only with great difficulty. The ophthalmoscopic examination was essentially negative, except for white, elevated areas at the upper and lower margins of the left disc and distention of the veins. The muscles of the left side of the face were paralyzed. Several lumbar punctures were made and the spinal fluid revealed normal pressure and a normal cell count and globulin content, and cultures were negative. No rose spots were observed. After the subsidence of the symptoms of acute meningitis and bronchopneumonia the temperature curve and general course were typically those of typhoid fever.

Case II.—J. J., aged 5 years, on November 5 showed dullness, apathy and anorexia. Four days later he developed a delirium and on the fifth day photophobia. His temperature on the day of admission was 105°, pulse 120, and respiration 36. At times he gave a prolonged, shrill cry. He was restless, tossing about, and showed a tendency to lie on the abdomen or on the side, rarely on his back. There was marked retraction of the head and stiffness of the neck. In an attempt to flex the head on the thorax, rigidity was so great that the body was elevated. Photophobia was marked. Herpes labialis was present. Cutaneous hyperesthesia was general and so pronounced that the slightest touch provoked an outcry. The heart was normal. The lungs showed signs of bronchopneumonia. The spleen was palpable. Kernig's sign was strongly positive. Five days after admission subsultus tendinum and bilateral ptosis and strabismus of the right eye developed.

The meningeal cry and muscular rigidity were still present on the seventh day after admission, but the eye symptoms began to subside. The blood examination yielded practically the same results as Case I except for a slightly higher leucocyte count and a less marked lymphocytosis. Blood cultures and spinal fluid were repeatedly negative. The Widal was also negative until late in the course of the disease, when it became positive. The stools contained typhoid bacilli. There were no striking abdominal symptoms and rose spots were not detected. The fever terminated by lysis.

Case III.—M. J., aged 12 years, also showed meningeal symptoms, but were milder in degree as compared with the other two. The onset was acute and began on November 9 with photophobia, intense supraorbital headache, restlessness and anorexia. On admission, November 13, temperature was 101.4°, pulse 100, and respiration 22. The examination was practically negative, except for severe photophobia and slight aphasia with a drawling speech. Eleven days after admission he developed pa-

*Read in Section on Pediatrics, Case Report Session, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ralysis of the right side of the face, which persisted for four days. The differential count showed a marked variation from the normal between the polymorphonuclears and lymphocytes, the former ranging from 26 to 52 per cent, the small mononuclears from 22 to 63 per cent, and the large from 9 to 23 per cent. The spinal fluid was normal. The Widal was negative on November 16 and positive on November 20, eleven days after the onset. Typhoid bacilli were recovered from the stool.

SYMPTOMS IN COMMON

In the three boys meningeal symptoms predominated in the early stage of the disease, but cleared up before the end of the febrile period. The fever terminated by lysis and was fairly typical in its course and characteristics of typhoid fever. Rose spots were not observed in a single case. The stools were not characteristic of typhoid macroscopically. Blood cultures and spinal fluid were persistently negative. Widal was positive late in two cases and early in one of the cases, and in all cases the stools were positive for typhoid bacilli. Two with the severest symptoms developed bronchopneumonia. The blood picture was very similar in all the cases, the polymorphonuclears steadily decreasing, the lymphocytes proportionally increasing during the progress of the disease.

Great diagnostic difficulties were encountered in these cases. In the first case cerebrospinal meningitis, miliary tuberculosis, encephalitis lethargica and acute poliomyelitis had to be considered. When the second case was admitted with the same group of symptoms the epidemic nature of the affection practically ruled out acute miliary tuberculosis and encephalitis. Up to this time, typhoid was only considered a remote possibility, especially in the absence of clinical and laboratory diagnostic proofs. Botulism also entered into consideration, but was excluded by the subsequent course of the disease, as were poliomyelitis and miliary tuberculosis because of the transitory stage of the symptoms of paralysis. It was not until after the third child was admitted and the typhoid organism recovered from the stools that the diagnosis of typhoid was definitely established. This was further confirmed by positive agglutination reactions, which were finally obtained in all the cases before they left the Hospital.

Attention has been called to the fact that typhoid fever during certain epidemics shows profound nervous symptoms, meningeal in type, which occur during the course of the disease with varying frequency, at times in a large number of cases. They occur almost exclusively in young individuals, often late in the febrile period. However, they may occur as early as the first or second day of the fever, especially in children, and may so dominate the clinical picture that diagnosis becomes extremely difficult, the real nature of the condition being recognized only when enlargement of the spleen, diarrhea and roseola appear. There seems to be either a selective affinity for typhoid toxins or a seat of predilection of the typhoid bacilli in certain strains of the organism. This would account for the greater incidence of meningeal complications in some epidemics than in others. This point is well illustrated in a milk epidemic of typhoid, observed by Curschmann, in which five nurses were taken in quick succession, all of whom developed meningeal symptoms which predominated the first week. He designated these as cases of "meningotyphoid."

TYPHOID FEVER IN CHILDREN

While infants enjoy a relative immunity to typhoid fever, children are quite as susceptible as adults, but they are more resistent to the typhoid toxemia. The cases are milder, the duration shorter, and more are of the abortive type. The pulse is more rapid, vomiting more frequent and diarrhea more constant, convulsions and meningeal symptoms are not rare, and transitory aphasia occurs more frequently in children. There is more variation in the temperature curve and the pulse increases in proportion to the temperature. Dicrotism is rare. The stools resemble those of ordinary diarrhea, tympanitis is not severe, and gurgling and tenderness are infrequent. Under six years of age hemorrhage and perforation rarely occur, eruption appears early, and the spots are fewer in number and less distinctive. The low leucocyte count is not found in the very young. A count below 6000 is strongly suggestive of typhoid fever. Complications and sequelae are less common.

Nervous Symptoms. — The nervous symptoms in typhoid fever may be (a) toxemia, (b) pathological changes in the meninges, or (c) demonstrable lesions in the brain or cord.

Toxemia.—The intensity of the nervous symptoms due to toxemia are out of proportion to the pathological findings.

Pathological Changes in the Meninges.—The dura may show hyperemia and adhere to the inner surface of the skull. The pia arachnoid may show edema-

tous infiltration, injection and adhesion with small round cell infiltration (in the more severe cases) continued along the vessels into the brain. Subarachnoid hemorrhages and purulent meningitis are rare. Some cases show symptoms that are dependent upon macroscopically or microscopically demonstrable lesions. During some epidemics profound nervous disturbances occur which can be ascribed only to acute inflammatory processes involving the meninges. In these cases stupor is very slight. The patient complains of very severe headache, photophobia, vertigo and tinnitus. Pain in the back of the neck and rigidity set in. Twitching is present. The reflexes are hyperactive. Facial herpes is present. The intensity of the cerebral symptoms is not proportionate to the constitutional manifestations. The duration of the meningitis is variable, sometimes five to twelve days, sometimes throughout the greater portion of the febrile period. In these cases the findings vary from simple hyperemia to purulent meningitis. This type occurs ordinarily in children.

Pathological Changes in the Brain.—Symptoms depending upon lesion of the cerebral tissue and its vessels are infrequent. When present they occur during the last part of the febrile period or convalescence. There may be embolism or thrombosis with cerebral softening. Suppuration is rare. Alterations of the cord are uncommon, although they do occur and give rise to symptoms suggesting Landry's paralysis.

DISCUSSION

Dr. James H. Atlee, Chattanooga, Tenn.—Typhoid fever used to be considered a disease of adult life and was very seldom seen in children, but we see typhoid fever among infants and children more frequently than is supposed. In the last few years since the sanitary conditions have improved we have very few cases of typhoid fever in Chattanooga. One case I saw was a child of six months whose father had died a few months previously of typhoid fever. The diagnosis was confirmed by culture and the child made a complete recovery. Of course, you all know that the course of typhoid fever in infants and children is very mild. They quickly run through a week or ten days and the treatment is symptomatic.

Dr. Beck (closing).—I would like to call attention to the fact that in some of the epidemics among children the mental manifestations occur quite commonly. This was rather a surprise to me when I looked up the literature. Epidemics are cited in which the disease frequently resembled very closely meningitis. Kerschner called attention to an epidemic in which the mental symptoms predominated. In children, as Dr. Atlee said, we are more apt to have variations from the normal type. Typhoid in children is quite a different matter from typhoid in adults. We found in our service at the Mercy Hospital during the past three or four years, since typhoid fever is relatively decreasing, that we have more atypical cases and experience more difficulty in diagnosing these cases. It was really only after the third case of our group was admitted and after we found the Bacillus typhosus in the stool that we were sure we had to deal with typhoid. The duration of the mental symptoms was from four to seven or nine days, and they all appeared early in the disease. The onset began with convulsions and mental symptoms in all three cases. I think they are a unique family group and worth while presenting because of the number occurring in one family.

TROPICAL DISEASES AND PUBLIC HEALTH

SYMPOSIUM ON MALARIA

DEVELOPMENT OF MALARIA CONTROL WORK IN ALABAMA ON A COUNTY-WIDE BASIS*

By S. W. Welch, M.D.,
State Health Officer,
Montgomery, Ala.

In the fall of 1917 and throughout the entire year of 1918, the United States Public Health Service did a very thorough malaria control work around Camp Sheridan in Montgomery, Camp McClellan in Anniston, and in the Muscle Shoals district. This work consisted of thorough drainage of a one-mile zone around the camps, oiling places that could not be drained, and stocking the waters with top minnows. Much of this work was neglected after the troops were removed from the several camps and work was discontinued at Muscle Shoals. I wish, however, to give public and official recognition of this valuable piece of public health work done in Alabama by the United States Public Health Service. It was the beginning of the end of malaria destruction in the South.

The State Board of Health of Alabama had a very inadequate appropriation at that time and could continue the work only along the lines of distribution of top minnows in all the waters of the State. The value of this single activity cannot be over-estimated.

In 1920, a cooperative work was begun with the United States Public Health Service, the International Health Board and the State Board of Health, working in small centers of population. There were seven projects of this nature worked in 1920, cooperating with these several agencies, and four or five others done independently by the Alabama State Board of Health. This work proved so satisfactory that five counties were selected in 1921 and placed under the supervision of an engineer and the work was begun on a county-wide basis. It was decided that work in the small communities, while a most excellent method of advertising, was a waste of time, money and energy. One engineer operating through the county health officer and his rural inspector could cover a whole county with the same time and expense as were necessary to cover one community in several counties.

The success of this plan of operation was clearly demonstrated by Mr. Johnson in 1921. The results of the demonstration were placed before the International Health Board and the United States Public Health Service, which gave their approval. A plan to take twenty counties and administer them in the same manner in 1922 as the five counties had been administered in 1921 was worked out. The work of 1922 has vindicated the feasibility of this plan of operation. The International Health Board and the United States Public Health Service have placed a number of egineers in Alabama. They have been assigned to zones of activities. Eighteen counties have been worked. The small towns that have applied for assistance have had assigned to them an engineer to supervise the work and a small subsidy added.

The most notable piece of work of this kind has been done in Mobile, a large center of population. Dr. Griffitts was assigned by the United States Public Health Service to the local Health Department. The City and County of Mobile put up $30,000 and the State and International Health Board $5,000, which was disbursed by the County Health Officer. This has been pronounced the best piece of malaria control work of its kind which has been done in the South.

A large number of small projects have been put over in a number of other counties, making twenty-seven of the more malarious counties which have had malaria control work done in them. It is fig-

*Read before the National Malaria Committee (Conference on Malaria), meeting conjointly with the Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

ured that it will take a minimum of five years to clean up a county. We have attacked those counties which have a large malaria incidence. We figure that if we control our worst areas there will be a tendency for the disease to die out in the less heavily infected areas. The demand from smaller towns for assistance is growing. The demonstrations which have been made in the towns of Hartford, Dothan, Demopolis, Brewton and Eufaula have been outstanding in their success.

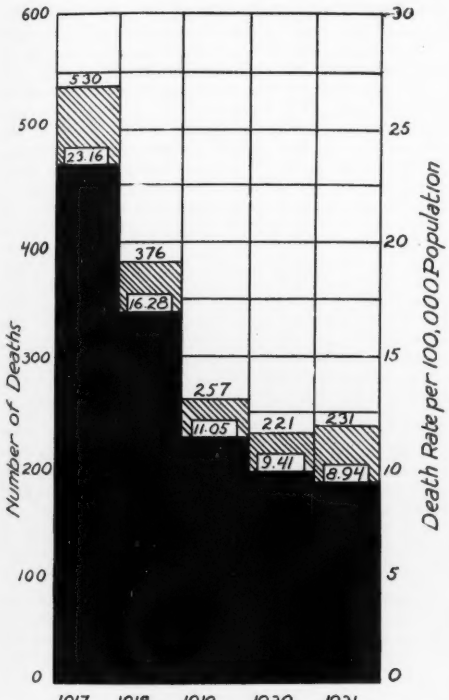

Chart Showing
Deaths from Malaria Fever.

It is a notable fact that in these towns not a single case of dengue fever of home origin occurred during the past season — demonstrating that the malaria control work had gotten rid of the culex and stegomyia mosquitoes and there were no conveyors left to distribute the disease.

We plan to continue the work in the twenty organized counties for the next four years, following up the same methods which have proven successful in the last two years, and also to do project work in the small centers of population whenever they apply.

The method of working the counties is for the State Engineer to go to the health officer of a county and the two work out a plan of operation for the county. The engineer surveys the territory, lays off the ditches and makes a report to the State Board of Health, the International Health Board, the United States Public Health Service, and to the county board of health. The health officer then, as the executive officer of the county, puts the construction work in charge of the county inspector. The engineer visits the work from time to time for the purpose of seeing that the construction work is properly done. Where drainage cannot be obtained, oiling is advised and the inspector sees that this work is done.

The interest of the whole population of the State has been aroused by the successful campaign. Large areas of farm lands have been drained because of the agricultural benefits which have been found to come from the demonstration areas drained by the engineers for malaria control purposes. In the counties of Talladega and Calhoun more farm drainage has been accomplished in the last two years than in the previous ten years, and the malaria incidence of these two counties has fallen to a negligible quantity. This work has not cost the State Board of Health anything except the salary of the engineer. It has been done by the owners of farm lands, and while agricultural drainage is primarily the object in view, malaria control has been an outstanding by-product of the effort. It is one of the objects of the engineers to impress upon the farmers of the State the value, from a health standpoint, of drainage of low lands on their farms, but he does not neglect to tell them of the increased value of having this fresh alluvial soil which will produce from three to fourfold more than the uplands. When the farmer becomes interested, the engineer lays off the ditches and the farmer constructs them.

There are three very extensive agricultural drainage districts now projected in

the State which will control a very extensive malaria breeding area. The State Board of Health will cooperate with these commercial enterprises.

A law was passed in 1919 requiring any company doing construction work in the State, such as highways, railroads, or any other construction work, to drain all borrow pits, thus leaving no place where man-made malaria could be found. Regulations formulated by the Federal Power Commission for the government of impounded waters on navigable streams have been of much value. In the impounded waters of Mitchell Dam, now being built by the Alabama Power Company, something like seventy-five ponds have been built and stocked with top minnows which will be released when the waters are impounded and rise to the level of the ponds. The army of destroyers will be ready to attack the invading mosquito hosts when the spring time opens.

Top minnows have been distributed lavishly in all the waters of the State, and we believe that this natural enemy of the anopheles larvae has been the most potent single force in the reduction of malaria.

The State Board of Health has been working upon regulations governing the impounding of water for more than a year, but has not yet been able to formulate satisfactory regulations. We have taken the advice of our distinguished leader, Dr. Henry R. Carter, who advises us that "the work had better be done right than quickly."

As a result of this work the number of deaths from malaria in Alabama has fallen from 530 in 1917 to 231 in 1921. The number of deaths in 1922 will probably be less than that of 1921.

In the light of these facts, we feel that we have adopted the proper method of malaria control work in Alabama and feel that we are making substantial progress. If the cooperative agreement worked out between the United States Public Health Service, the International Health Board and the State Board of Health can be maintained, we are justified in forecasting a malaria free state within the next few years.

DISCUSSION

Dr. W. S. Leathers, State Health Officer, Jackson, Miss.—It seems to me that Dr. Welch has very properly placed emphasis upon certain phases of malaria control work. It is evident that much attention is being given to educative methods in getting the people aroused relative to cooperating with the State Board of Health in the prevention and suppression of this disease. I feel sure that insufficient emphasis has been placed upon educational work in the control of malaria, generally speaking. It is true that during the past several years the various state boards of health in this country have been passing through a pioneer stage in the control of this disease and the method of demonstration has been necessary in so far as it has been used in municipalities for convincing the people of the possibility of preventing malaria and also in teaching them the methods which should be employed for this purpose. It is perfectly evident that no better method can be used in the prevention of any disease than that of demonstration. It is in the true sense of the word educative in its effect upon the public, but I wish to emphasize especially the desirability of giving more attention to educating the children in the public schools relative to the cause of malaria, its prevention, and its economic relation to the development of a state. If we could uniformly bring before the school children of the country the facts about malaria which we now know to be sane and practical, it would appear to me the most substantial step that could be made in the reduction and ultimate suppression of this disease. So fundamentally the whole plan of malaria control should be educative.

I think there is no question about the fact that the plan to be used in the future should be one that is applicable to a county as a unit of organization. It would seem to me that sufficient demonstrations have been conducted in municipalities and that now more emphasis should be placed upon the county-wide plan.

I think all of us realize the fact that in controlling malaria it is practically impossible to eradicate it from any particular area unless the plan of work be sufficiently extensive to cover a large territory so as to avoid the possibility of reinfection in areas where control measures are being instituted. There is another point that needs to be emphasized, and that is in instituting measures for the prevention and control of this disease, that permanent health organizations should follow in the wake of such work or precede it.

It is obvious that in controlling malaria in a particular area methods used should be adapted to local conditions. It may be necessary to use drainage as the major agent, or possibly quinin in the sterilization of the blood. Under certain conditions screening would be the method to be emphasized, and the top minnow should be employed in streams and small bodies of water. It is certainly important not to emphasize unduly any particular method, and, therefore, it is imperative to make a careful study of the results

to be obtained in drawing conclusions with reference to the effectiveness of the methods to be used or which are being used.

It is, of course, important to secure the cooperation of all local agencies such as the Rotary Club, the Kiwanis Club, the Parent-Teacher Association, the Chamber of Commerce, county and state officers, and so forth. There is perhaps no more important point to emphasize educationally speaking than the economic aspects of malaria control work, the bearing of it upon the agricultural development of the country, and what it means from the standpoint of increasing land values. This can be shown in a concrete way so as to impress the mind of the business man.

Incidentally, in the cotton-producing states malaria is at its worst during the time cotton is being picked and labor is most needed, and as a result of the high incidence of the disease it often proves disastrous to the farmer or planter. By making a careful survey of the malaria incidence of the county the per capita cost of malaria can be shown, comparatively speaking.

In doing drainage work, not only are the agricultural conditions of the country improved, but in exterminating the mosquito it is made more comfortable for living purposes.

Dr. Welch referred to the fact that in Alabama the deaths from malaria had been reduced about two-thirds. This is rather a remarkable showing, and in this connection I wish to state that deaths in Mississippi have been reduced about 50 per cent. I believe we have a more serious problem because more than half of the population of the State are negroes. It is of interest to note that the Delta, which includes about fourteen counties and parts of counties, constitutes one-seventh of the area of Mississippi; and in this territory there is a large percentage of the tenant class, chiefly negroes. In this area about 50 per cent of the malaria of the State is found.

The incidence of malaria in Mississippi during the year 1915, according to the reports received by physicians, showed approximately 150,000 cases. The reports for the year 1922 show approximately 106,000 cases. This shows a definite reduction in cases and reference has already been made to the decrease in morbidity from this disease.

It is most gratifying to know that malaria is being reduced not only in Mississippi but throughout the entire South, and I predict that in the next twenty-five years malaria will be reduced throughout the Southern states where it is now prevalent not less than 75 per cent both in cases and deaths, and in many areas it will entirely disappear.

I feel that in this work we should give proper recognition to the splendid cooperation received from the International Health Board and also the assistance which is being given by the United States Public Health Service. Dr. W. D. Fricks, who is at the head of the malaria control work of the United States Public Health Service, is rendering invaluable service to the state health officers in their effort to promote this phase of public health work.

Dr. L. L. Williams, Jr., Past Assistant Surgeon, U.S.P.H.S., Richmond, Va.—We are very much interested in this particular phase of the work that Dr. Welch has just read. He is fortunate in one respect. He said that this year he extended the work into twenty counties, grafting it on to the county health departments. If we had twenty counties in Tidewater Virginia with county health departments we would feel that we were fortunate. We have just one county health department in Tidewater Virginia. Our main problem is to get permanent organizations in the counties. We feel that we cannot do satisfactory work without them. We have done a sufficient amount of work to prove that we can, with the assistance of cooperative funds, at least, secure county health departments in the rural districts. We have done it in one county so far, and they are undertaking rural control of malaria.

I notice that Dr. Welch and Dr. Leathers both said, and I have heard people say for a number of years, that you must hitch up agricultural drainage and mosquito control and the prophylactic use of quinin, but in our counties we put screening first. We find that if the drainage is scattered we do not get immediate results. It is too far distant to look for a sufficient result, so we put rural drainage last on the control program.

We have seen no great success from quinin campaigns, and I do not think that any one before us has, but I do not see why we should not have great success from screening campaigns. We believe that in a county with a permanent health organization, where an adequate county-wide screening campaign goes on, with the county health department on the job all the time to keep up the education, we can get better malaria control in that way than in any other that has been tried.

Dr. H. R. Carter, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.—In the Wilson, Va., campaign what we depended upon was drainage. We did screen, and perhaps the most important single thing we did was to raise the pond. There were 411 cases in the district. There had been 418 people there, but seven had died of it. There was a marsh left by an old saw mill pond, some streams that were breeding mosquitoes, and a pond over a hundred years old that was breeding anopheles freely. We cleared the banks and raised the pond, and we screened. I think the main thing done was raising the pond and drainage, though screening certainly helped.

I want to congratulate Dr. Welch. I had no idea that so much and such successful work had been done in any state.

The reason why the municipalities are taken care of first is that the work in them does give a bigger return for each unit of expenditure than in the counties.

To have reduced the malaria death rate by 56 per cent in Alabama, to have taken up twenty-seven counties, and to believe that possibly in five years more all of Alabama will be controlled, is to me wonderful.

Dr. James A. Hayne, State Health Officer, Columbia, S. C.—We have been confining ourselves to demonstration methods, drainage, etc. That has been quite successful, and we hope later to put on the county work, though we feel that probably we shall be shooting at the moon in trying it there. I do not think that we shall ever be able to make a hundred per cent demonstration in any county in South Carolina.

Mr. George Parker, Sanitary Engineer, Jackson, Miss.—It appears to me, from whatever angle we view the malaria control work, that we must first base our program upon a budget.

We must have the appropriation to carry on the work, for otherwise, of course, we cannot function at all. We must get before the people the proper conception of what the malaria problem is, so that we can get the proper appropriation to carry on the work. We must pay more attention to the educational features, as Dr. Leathers intimated. We must let the people know what the problem is, what we are trying to do, and why we are trying to do it, disregarding the health benefits that may come so far as their bodily comfort and peace of mind are concerned.

We can commercialize the malaria program, or any other health program, for that matter. Figure it from an economic standpoint. Take the assessed values for taxation and we shall find that probably 1 per cent will be enough not only to carry on malaria control work, but enough to sustain and carry on a full-time county health department. The people will not understand this until it is brought to them in a business-like manner. We must put our malaria control work on a business basis and show the people that we are going to spend the money in a business-like way, and pay them a dividend upon the money spent. When we do that there will be no difficulty in obtaining an appropriation. When the figures are compiled and presented to the board of supervisors or board of commissioners in such a way that they cannot tear them to pieces and make them appear false, we shall be successful in getting the money for the work.

In Mississippi, where I have been working this year, we have a state almost entirely devoted to agricultural purposes, so in carrying on the work we must realize the value of malaria control to agriculture. We take into consideration the cooperation we can get from the agricultural agents, the agricultural high schools, etc.

The agricultural agent is in the county principally as an expert adviser along agricultural lines. If through him we can demonstrate to the farmer that his land can be drained and made to produce a certain kind of crop which will give him returns in addition to what will be gained from the control of malaria, he will be more likely to do the work. He increases his man power and improves his land by getting rid of mosquito-producing areas.

There is so little of the spectacular about malaria control work that we cannot put it on a health basis alone, but must consider it a commercial problem. This will reflect directly upon the legislature, and serve to help secure appropriations for the state boards of health.

Dr. Clinton A. Kane, Director Malaria Control, State Board of Health, Richmond, Va.—I want to say a few words about what we are doing in Virginia in malaria control through the school course as conducted in seven counties in Virginia.

During the past year three hundred schools conducted a ten weeks' course, one hour weekly, the pupils using Dr. Carter's Primer and the Virginia Malaria Catechism. For the teachers we used literature and pamphlets as issued by the United States Public Health Service. At the end of the ten weeks' period examinations were conducted by the teachers and the best and poorest papers were sent to the State Health Department.

We followed up the course by field demonstrations in as many schools as possible. We propose this coming year to extend this course to all the schools in the malaria section, about 1,000 in all.

We further propose to establish a camp for field instruction for boys selected from different Boy Scout organizations. This course is to be extended over a period of two weeks.

Mr. L. M. Fisher, Sanitary Engineer, Columbia, S. C.—I noticed during the year, in reports sent to us of the work in different states, the drainage work in some counties was reported one hundred per cent complete, and I would like to know approximately how much drainage work was involved in a county, how many miles of ditches, etc., and what the cost of it all was.

I would also like to bring up this point. Dr. Welch quoted the deaths in Alabama as being reduced from 530 to 231—530 in 1917, 231 in 1921. The question of the natural reduction in malaria cases comes up in my mind. We had in South Carolina, about 1916 or 1917, some 500 deaths from malaria, too, but last year there were only 254. I do not think that our work accomplished much of that reduction, and I would like to have a discussion as to just what part the natural reduction of malaria played.

In South Carolina we are confronted with this problem: we have only six county health departments functioning now and only one of them is in the malaria-infected section of the State. It is almost impossible, it seems, to me at least, to organize a full-time county health unit in those counties in which the colored population is larger than the white, and I would like to know what the best procedure would be in that kind county.

Mr. W. G. Stromquist, City Health Department, Memphis, Tenn.—We all know that the general opinion throughout the North is that the Southern states are very unhealthful places in which to live, and that a great number of people hesitate to move here, even though better economic opportunities are offered.

In a recent weekly report of the Public Health Service there was a statement of the number of full-time county health officers in the various states. In the eleven states of the malaria belt, there were 112; in eighteen other states, 105; and in nineteen Northern and Western states, none. This shows that in the malaria belt there

are more full-time county health officers than in all the rest of the United States. Of course, the mere appointment of full-time health officers does not necessarily solve the problem, but it shows that the people are aroused to the need of public health work and that we are making rapid progress. As we attack and overcome the problems which are found only in this section, the problems which we have in common with the other states will also be included, and in a not far distant time the South may lead the rest of the country in sanitation.

Dr. A. P. Harrison, State Board of Health, Austin, Tex.—I have been appointed a committee of one to present to the National Malaria Committee a message from Texas, informing you of what we hope to be able to carry out during the next year's work in that State.

In approaching the problem of malaria control and the general problem of mosquito control, we consider it important to place this problem before the public as coming from laymen rather than from the State Board of Health, for various reasons. It was essential, of course, to obtain an appropriation from the Legislature. Now, legislatures are prone to consider any proposition coming from the health department as a health problem alone, and perhaps a hobby of the state health officer. Therefore, we have interested the Texas Chamber of Commerce, and we recently had a very successful meeting in Houston. During that meeting plans were formulated, which are embodied in some resolutions that I should like to read to you. The resolutions, I am sure, are perfectly self-explanatory.

Before reading the resolutions I may say that the recent epidemic of dengue fever in Texas was really a Godsend in one respect, because it did more to arouse interest among the general public in mosquito and malaria control than possibly anything else could have done.

SUGGESTIONS FOR MOSQUITO CONTROL CAMPAIGN

Be it resolved by this convention, called by the Texas Chamber of Commerce to consider state-wide mosquito control, that the following be adopted as resolutions by the Texas Chamber of Commerce:

(1) The division of the malaria and dengue belt of the State into districts containing not more than ten counties to each district.

(2) The appointing of ten men whose duty it is to organize the counties in each district, and to direct and carry out the necessary control measures therein with the help of assistants; it being the further duty of the above mentioned ten men to raise the necessary financial assistance from the cities and counties in each district.

(3) The raising of the necessary funds to provide the salaries and necessary traveling expenses of these ten men, which funds reckoning from past experience in obtaining the services of trained men, who alone could do efficient work, would amount to fifty thousand dollars.

(4) It is suggested that this amount be requested of the Legislature as a special emergency appropriation. The money for actual field control measures to be supplied by the cities and counties cooperating and participating in the work.

(5) It is further suggested that the Texas Chamber of Commerce request each and every secretary of every chamber of commerce in Texas to assume the responsibility in his district of assisting to raise the necessary funds for local control measures and to stimulate interest, thereby obtaining the cooperation of the people.

GENERAL MEASURES

(6) It is thought to be essential that adjacent states also carry on mosquito control work, particularly along the borders of the states adjoining Texas. It is, therefore, suggested that a resolution be drafted and adopted encouraging such work in neighboring states, and that the health officers of these states be sent a copy of this resolution.

(7) It is believed to be most important that the Mexican border be protected by such control measures, and a resolution is suggested requesting the Surgeon-General of the United States Public Health Service to render all the assistance possible in this respect.

(8) The following committees are suggested:

(a) A permanent committee to stimulate the necessary legislation and request the necessary appropriations.

(b) A permanent committee to handle the necessary publicity of the campaign.

(c) A permanent committee to educate and inform the public of the necessity for this work, including the obtaining of the cooperation of railroads, and all large industrial concerns. This committee should request all hardware dealers to sell for the purpose of screening against mosquitoes only screen wire of 16 or more mesh to the inch.

Whereas, we as an organization having the welfare of our State and the betterment of living conditions therein as our chief reason for existence, realize the fact that there is annually within our State an enormous economic and financial loss on account of preventable diseases, which diseases at times, by reaching the proportion of epidemics, cripple the business machinery of our State and its commercial, financial and social undertakings, not to mention the far more important fact of the loss of human life and the suffering and hardships which these diseases inflict upon our citizens, we further realize the fact that through judicious inauguration and conduction of tried and proven health measures under the direction of our State Health Department these diseases may be controlled, materially reduced and even be eradicated.

Whereas, we further realize and know that in order to conduct such health measures there is an absolute necessity for the appropriation of funds on the part of the State to finance these undertakings, and enable the Health Department to afford the protection to our citizens which it can do in no other way,

Be it resolved, That the Texas Chamber of Commerce, now assembled in special meeting for the purpose of considering the ways and means to combat preventable disease in the State of Texas, does hereby earnestly request the Legislature of the State to accede to the rquests which will be duly presented to that body by our State Health Officer, and provide the State Health Department with adequate funds, which funds are now a matter of vital necessity to the success of the protective measures contemplated.

Be it further resolved, That each local secretary of every chamber of commerce in Texas be, and is hereby, requested to explain to his representatives and State senators the necessity for this assistance, and that each local chamber of commerce pass resolutions respectfully requesting its legislative representatives to support the program of the State Health Department as one of the most vital interests of the State of Texas.

Be it further resolved, That a copy of these resolutions be sent to the Governor of the State, respectfully calling his attention to the campaign and requesting him to embody in his message to the Legislature a special request to consider carefully these requests to support the program of the State Health Department with a special consideration for an appropriation for the mosquito control.

Be it further resolved, That in order to inform the public of the proposed measures for their protection, and the necessity for their support and cooperation, a copy of these resolutions be given to the Associated Press of the State.

Dr. Roy K. Flannagan, Assistant Commissioner, State Board of Health, Richmond, Va.—The work done by Dr. Clinton A. Kane, Director of Malaria Control, and Dr. L. L. Williams, United States Public Health Service, who have charge of the anti-malaria work in Virginia, has given excellent results. They are carrying on the campaign along all lines. They are featuring the distribution of literature in malarious sections. I would like you to see the concise little bulletin that is being distributed broadcast through the schools. Though funds are limited, they are not neglecting to do drainage work. I hope you will look at the Virginia display at the Exhibit Hall. Then you will see what is being done. A moving picture has been made with scenes "before and after taking" that will be

shown during this meeting. All of you should see it.

I had the very great privilege personally of following Dr. Henry R. Carter through the swamps around Wilson, Va., and of supervising the one hundred per cent demonstration that was done there several years ago. The work elsewhere in Virginia has been and is being conducted along the same lines. We are emphasizing screening and education of the people because we think they bring the best and most lasting results. Then the other things necessary are done as opportunity and funds available permit. There were six or seven towns in which we worked averaging 90 per cent drainage and control. Smithfield, the town from which the famous Smithfield hams come, was one of the worst malaria-infected places in the State up till this year. Under our direction they completed a drainage project there to the general comfort of all the people and a marked reduction of malaria.

A Member.—How much has the State of Virginia appropriated?

Dr. Flannagan.—Six thousand five hundred dollars, which the International Health Board matches with an additional $6,500, and the United States Public Health Service adds the services and traveling expenses of a physician expert.

Dr. S. C. Beach, Illinois Central Railroad, Chicago, Ill.—I would like to say a word on this subject from the standpoint of the railroad. The Illinois Central, running through a portion of the malaria section of the United States, is tremendously interested in this subject. We have backed up this anti-malaria proposition not only financially but practically in work actually done. You of the South have no monopoly on malaria. We have a good working plant in southern Illinois. I refer to Carbondale and Herrin, in the southern part of the State. Last year we had some 456 cases of malaria in that neighborhood. Some of these cases originated from swamps near the Illinois Central shops. We shot some drainage ditches there with dynamite and the malaria incidence this year was something like 81 cases—quite a remarkable reduction.

All this has a secondary influence, which is very important. It is that the Illinois Central is getting more interested in this anti-malaria movement. This is the result of the efforts of the United States Public Health Service, the International Health Board and interior forces in the Illinois Central. Five or six of the states through which the Illinois Central Railroad runs are Southern states, and you can add southern Illinois to the states which have considerable malaria. We are going after this thing in what I think is the right way, in a cooperative way. Having started this movement, like any moving body we are gaining force as we go on, and we anticipate rendering visible, actual and practical assistance along these lines.

Dr. D. J. Williams, County Health Officer, Harrison County, Gulfport, Miss.—I am before you in an effort to answer some of the questions that have been asked and that seem to have been studiously dodged by the speakers who followed the questioners.

In my County (Harrison) we have about 546 square miles, with a 28-mile coast. In it is a relatively large area covered by swamps and marsh. We began the anti-malaria work in 1916, when it was largely educational. In January, 1918, we began the intensive work, selecting an area near the coast about a mile wide, which contains about two-thirds of the population of the County. It was estimated that the required amount of ditching in this area would be about 225 miles. We have already constructed about 215 miles. The cost of the construction, maintenance, oiling and other expenses incidental to the campaign has been approximately $121,000. We estimate that we are saving about $57,000 annually to our County, which has a population of about 38,000, with from 23,000 to 25,000 living within the area intensively worked. This $57,000 is saved to our people by the appropriation of $15,000 annually for the County Health Department.

In the beginning of our campaign we had an average of 1,540 cases annually. Last year we had 112 cases, more than twelve of which we know definitely came from outside of the County. We think that in Harrison County, so far as our individual County is concerned, we could approximate one hundred per cent reduction in malaria if we could control the introduction of the disease from outside from this time on.

It is our idea that the county-wide work can best be started in a limited area, letting the lessons taught in that way spread throughout the county. If that is so in one county, it will hold true for a group of counties. We believe this, because we have had a reduction in the unworked area corresponding to that in the area which we have intensively worked.

As to screening, while some have stressed screening, I want to say to you that where you have "Bohunks" and practically every other race represented you will not get anywhere with screening. If you have the right kind of people, you may do effective screening.

In the beginning I had a great deal of misgiving about attempting to sterilize the malaria carriers, but the more work I do along this line the more I am convinced of its value. As you approach one hundred per cent control, you will have to sterilize the carriers. We did not get far with sterilization at first. I was not very enthusiastic over it, but I am willing to see anything tried in malaria. When we reduced our cases down to 750 we began to sterilize the carriers, and when the number dropped to 400 we began to index them. Then we reduced the number to 250; and when we had them all indexed and knew the conditions in the homes, we began to get a pretty good grasp on our malaria problems.

If you can show any organization, your board of supervisors, luncheon clubs, chamber of commerce, etc., in a highly malarial district that you can save your county $57,000 a year, it will appeal to them, and you will have a basis for getting an appropriation for health work.

Dr. L. D. Fricks, Surgeon, United States Public Health Service, Memphis, Tenn.—I find my-

self in accord with Dr. Leathers' statements relative to the importance of education in malaria control. I believe that the coordination of malaria control with other rural health work in the South, and education of the rural population, especially the younger population, are the important elements in the malaria control situation.

I am not in entire accord with Dr. Leathers' statement that we probably in the past have not appreciated the importance of educational efforts. To my mind, although we may not have appreciated the importance of education, all the work that has been done in malarial control in the past four or five years—all the work worth while—has been so because of its educational value. The direct effect—the reduction of the number of cases by one hundred here, five hundred there, or perhaps a thousand in another area—I think is insignificant when we consider the amount of malaria in the South. But the educational effect is of great value and the education of ourselves is valuable, too. We are getting nearer all the time to the realization of the fact that different methods of control must be applied in different localities. We have our principles, yes, but no fixed rule that must apply to every community. Within a few years I believe that we can reasonably hope to look for great relief in the malaria situation in the South through the coordination of malaria control with other rural health work and the education of the people who are vitally concerned.

Dr. William Krauss, Memphis, Tenn.—Reference has been made to the problem of malaria control in counties that are not self-supporting. Why are they not self-supporting?

Several years ago I was connected with the State Board of Health of Tennessee as a member. There was an outbreak of smallpox in Maury County, which the County had for a year been attempting to handle. Neighboring counties made protest and the State Board of Health finally took it up and cleaned the situation up. When the work was finished it was found that there was no one to pay the bill.

For contrast, Shelby County, in which Memphis is located, in 1922 paid $372,765.54 in State automobile tax, of which it gets back about $6,000. If it is possible for the State to collect that amount for the highway fund, why can it not do the same for health work?

Dr. T. H. D. Griffitts, United States Public Health Service, Mobile, Ala.—It is important to have on file in the state health department as complete a health record of every community as possible, so that if the question ever comes up about malaria in the state anywhere the state health officer may have at his finger tips information that may be readily applicable to the correction of conditions. I believe in surveys and the recording of them. At the time they are made it may seem that the data collected are of little value, and yet they may be a strong fortification put into action at any time.

As to making "malaria drainage" subsidiary to agricultural drainage and regarding it only as an economic question, let us be careful. We are health workers. Our problems are health problems; our functions health functions. Let us regard malaria prevention primarily as health work, and agricultural development often a very valuable by-product of health work. And, by the same token, good health frequently is a by-product of drainage for agriculture. We are not economists; we are not agriculturists. However, we should be prepared to offer scientific assistance in the health phases of any development.

As to screening, I believe that in Virginia and in a great many other states, or sections of states, screening must stand second only to drainage, inasmuch as screening is an important protection also against other diseases in which the board of health may be as much concerned as with malaria.

Dr. Welch mentioned the apparent prevention of dengue as a result of malaria control work. If I may quote Howard: "Culex fatigans (quinquefasciatus) is the common barrel-breeder of the South." If we are doing strictly anti-anopheline work, as was done at Mobile this year, no attention is paid to fatigans, stegomyia, etc. By anti-anopheline measures solely we should not expect a noticeable influence on dengue. The breeding habits of our malaria vectors are quite distinct from those of fatigans and stegomyia (both of which, it seems, may be dengue carriers), and any efforts to apply to dengue prevention must cover artificial container production. No doubt Dr. Welch referred only to those places doing "general mosquito destruction," as some places are doing.

Dr. Welch.—I want to say, in reply to Dr. Griffitts, that in Brewton, Ala., and in Eufaula and other places we have controlled dengue fever. Mosquito control was so well carried out in Dothan, especially, and in Brewton (where at one time the pestiferous mosquitoes were so bad that you could not sleep in the hotels, even though they were screened, but traveling men have written me that they can now sleep there comfortably), that those towns did not have any dengue fever. It was present in every other town in the State, and I believe I am justified in saying that the anti-malaria work did control dengue fever.

When we go into a county we go to the worst sections of that county. Each farmer that undertakes the drainage of his land is called a project. The ditching consists of clearing, of cleaning a ditch, in opening an old ditch, and in digging a new ditch. In reporting that, according to the rules of the United States Public Health Service and the International Health Board, we report the progress of cleaning, of clearing, of opening old ditches and of cutting new ditches. When we finish that project it is one hundred per cent. We have never said that we had one hundred per cent in a county. It is the projects we are reporting on and not the county as a whole.

I do not know what legerdemain they practiced in South Carolina to bring about the reduction in malaria there. It did not just happen so in Alabama.

Dr. James A. Hayne, State Health Officer, Columbia, S. C.—The legerdemain was done by the

United States Census Bureau, which cannot accomplish anything in Alabama, as you are not in the Registration Area.

Dr. Welch.—The educational meth ds which we have used in Alabama have been screening, which extends to all parts of the State, and the introduction of top minnows. I must differ with Dr. Leathers in his estimation of the value of the top minnow as a controlling element in malaria, for I do not think that it can be overestimated.

Dr. Rose, in going over Alabama some time ago, noticed the amount of screening that had been accomplished in the rural districts, and was disposed to credit the fall in malaria to the amount of screening that had been done. Now, I do not want to underemphasize the value of other measures, but I believe the fall in the incidence of malaria is due largely to education.

We have had the Carter "Primer" in the schools now for three years, and it is a part of the school curriculum. I am sure that the high school boys who have learned the Carter "Primer" have been the greatest allies we have had in this campaign.

We have not neglected the use of quinin. I am very sorry that Dr. Maxcy did not report some of his observations in an impounded water region in Alabama, where out of 198 persons in the area 167 had malaria. It slipped up on us. Probably we should have known about it, but we did not until it was under full swing. The only thing to do was to send a man from house to house with the standard quinin treatment. Three families left off the quinin treatment after three weeks, and they were the only ones that had any relapses. They began taking quinin again and have had no more chills.

Speaking of county organization, we do not start a county organization in Alabama with less than $7,500. When we get the county health department started, the engineer is assigned to the county health office.

We do not put up any more money at all. The work is done through the county unit. In counties that are not organized the work is done through the State organization. Out of those organized counties in which work was done we have already had two counties to organize, and another has voted an appropriation, which has not yet been made available.

Speaking of the organization in Texas, I do not believe that it is possible to do any permanent health work by spasmodic effort. Public health work is a business, and until you have a business organization that appeals to the appropriating power as an organization that will function, you will not get anywhere. You are going to waste your money. When you get untrained people, in a moment of enthusiasm after an epidemic of dengue fever or some other epidemic has passed over, to go to the legislature and get the money and go out and spend it, then when you go back again for money you will not get it. You will not do anything permanent that you can stand on until you get a business organization. I believe that all public health work should be preceded by a business organization. I mean by that I believe you should have a sufficient personnel so that when you have done drainage and work of that kind you will have an inspector who will follow up the work next year and see that it is carried on. We have a contract that the municipality will furnish money enough for the inspector to come back the next year after and see that it is carried on.

Dr. W. S. Leathers, Chairman.—I would like for Dr. Welch to answer more definitely the question which has been raised by one of the speakers as to whether the reduction of malaria is due to the methods that have been used or is it simply decreasing naturally. It has been my belief that the methods employed have been educational and have had a generally educational effect upon the people in the control of the disease.

Dr. Welch (closing).—I thought that I answered that when I said that the methods used, the oiling, ditching and quininization, had brought about the results in Alabama. The first step was the demonstration by the United States Public Health Service in Montgomery, Anniston and Muscle Shoals. From that demonstration spread the knowledge that by ditching, by oiling and by the distribution of minnows in all the waters of Alabama this particular piece of health work could be accomplished. I do not know whether or not it spread to the rural districts of South Carolina, but I understood that similar work had been done there. Possibly they did not know about it, but I understood that work similar to that done in Alabama had been done there, but it may have escaped notice.

There is no question in my mind that educational methods—we are simply in the experimental period, although we are doing permanent work in drainage and screening—have been responsible for the reduction of malaria in Alabama, which has been spectacular. I see no reason why, if you locate the carriers in the spring and give them the standard treatment (we are doing that now in some counties where we have impounded water—watch for the first man who has a chill in the spring and give him the quinin treatment, and see that no mosquitoes get to him), I do not see why you cannot handle malaria by that business method just as you handle other diseases. If you learn where the first focus of infection is and stamp that out, you do not get the infection.

Dr. Hayne.—I rise to a point of personal privilege. I want to state that I was working on the Isthmus of Panama when the real malaria control work was done there and I spread that knowledge to my own State. The first real malaria control work in the United States was done in Hartsville, S. C.

METHODS FOR DETERMINING MALARIA PREVALENCE—THE SPLEEN RATE OF SCHOOL BOYS*†

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Everyone admits the desirability of "good malaria statistics." Everyone who has had to deal practically with the problem admits the difficulties peculiar to the collection of accurate figures on the prevalence of this disease. Many methods of collection have been devised. All yield information; and all have errors of more or less magnitude. Briefly, the more important and commonly used methods may be grouped under four heads:

A. History Index.—Physicians' cases or calls, house-to-house canvass, mortality and morbidity reports, insurance claims, sale of quinin and chill tonic, and opinion of intelligent laymen, etc.

B. Spleen Index.

C. Parasite Index.

D. Anopheline Index.

Of these, the spleen index has been but little used in this Country. Tropical workers regard it as the best single measure of malaria prevalence. Sir Ronal Ross[1] makes the statement that "the spleen index should be a nearly correct measure of the true malaria rate," but makes the following reservation: "Quinin, local conditions and other diseases (especially kala-azar) may affect the spleen index, but in most countries only to a small extent."

In this Country, Derivaux, Taylor, and Haas,[2] in 1917, examined 141 children near Lake Village, Ark. (April and May) and found only 4 enlarged spleens, whereas the parasite index on the same group was 17 per cent. They concluded that the spleen index in no way represented the true endemic index of malaria in that section.

In 1921, Dr. Barber and Dr. Coogle[3] examined 1261 boys in Mitchell County, Georgia. Of this number only 2.1 per cent showed palpable spleens. In three schools where a parasite rate of 5.5 per cent was found the spleen rate was 5 per cent. These examinations were made in February, a time of year when the findings would be expected to yield minimum figures. They were repeated on this same group of boys in Mitchell County and on the boys in a few schools in the counties surrounding, in September and October of the same year,[4] a time when findings would be expected to be at a maximum. Eleven hundred and eighty-one boys in Mitchell County showed a spleen rate of 1.3 per cent, while blood smears taken on 318 of the same school children showed 4.7 per cent positive. In 10 schools located in surrounding counties, 480 boys showed a spleen rate of 3.4 per cent and of 119 blood smears taken from both sexes, 9.2 per cent were positive. In this section it was again evident that the spleen examinations did not yield a significantly large figure and did not give a fair index of the amount of latent malaria.

However, there are certain obvious advantages in the spleen index which seemed to render further observations in other sections of the Country desirable. It is an objective method. There is little or no error of interpretation in skilled hands. It can be rapidly and easily applied to large numbers. The error due to sampling can be made quite small and readily calculated. It is practically as certain an indication of malaria, past or present, in an individual as the finding of parasites in the peripheral blood. If it could be used alone or in combination with a history index or parasite index, or both, as a yard stick by which to measure or indicate the amount of endemic malaria, it would help us to solve the problem of expressing more accurately the degree of prevalence of this disease over large areas and of gauging the effectiveness of control measures.

The results here reported are, therefore, a continuation of the work started by Barber and Coogle in south Georgia in an ef-

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fort to delimit more carefully the extent to which spleen examinations are of value in this Country.

METHOD

The method of spleen examination was similar to that recommended by Ross, Christophers and Perry[5] and the same as that employed by Barber and Coogle[3] in their south Georgia work. The boys were examined in the standing position. They were instructed to lean forward slightly, to relax the abdominal muscles and to breathe deeply. The examiner slipped his hand under the loosened clothing next to the bare skin and palpated in the left upper quadrant under the costal margin. When a definite spleen edge could be felt, descending on inspiration, the case was recorded as positive. The degree of enlargement was roughly indicated as "palpable," "palpable one," "palpable two," and "palpable three or more fingers' breadth below the costal margin."

Whenever there was any doubt in the mind of the examiner about the result in an individual case, the boy was re-examined in both the standing and the reclining posture with abdominal wall thoroughly relaxed.

The authors worked together on a large number of boys to check each other and thus obtain uniformity in results. No attempt was made to detect slight enlargement of the spleen by percussion. This is too uncertain under field conditions. Only definitely palpable spleens were recorded as positive.

At the time of the spleen examination each boy was questioned individually as to whether he had had definite "chills and fever" of the every day type or the every other day type during the preceding year. The answers were classed as simply positive or negative history and formed the basis of the "history index."

Blood smears were then taken from a large percentage of the boys present and sent to the laboratory. Here a certain number were selected at random (representing about one-third of the total number of boys examined) stained and examined with thin smear technic. The resulting "parasite index" is, therefore, based upon a true random sample of the whole group measured.

Some objection may be offered to the fact that these indices are based only upon boys of school age and do not represent the population at large—all ages, both sexes. However, it must be borne in mind that it is impossible to measure the absolute amount of malaria in any population. It is practicable only to determine the relative amount in a sample population group and to use a similar sample for comparison in other areas or in the same area in other years. Instead of using a small sample of the population at large, as is usually done, these examinations were confined to a definite group of the population, and it must be borne in mind that the resulting figures are an *index* in the true sense of the word and by no means a direct measure of the amount of malaria.

Where reference is made to the mortality rate from malaria in the several counties in which examinations were conducted, this rate has been calculated upon the basis of the average number of deaths per 10,000 population for the past three years—1919, 1920 and 1921. On account of the small numbers concerned this gives a better value than a rate based on a single year.

RESULTS

It seemed desirable to select an area for study in which there existed a high malaria incidence. The southeast Missouri lowlands seemed to fill the requirements in this respect and opportunity was presented to make the first observations here. The country is low-lying, flat, Mississippi River bottom land, the topography of which is broken here and there by low ridges. It is bounded on the east by the Mississippi River and on the west by the tortuous, winding course of the St. Francis, the center being taken up by the Little River overflow. Twenty years ago, except for the settlements along the ridges, much of the country was a great wooded swamp, large areas having been completely under water during the flood season. Today thousands of acres have been drained, cleared and protected from overflow. This reclamation has left one of the richest agricultural sections in the world. Formerly a hot-bed of "swamp fever," "black water fevers," "yellow chills"

(every variety of malaria in its most pernicious forms), this disease still prevails to a considerable extent and is a serious economic problem in many areas.

In these lowlands 76 schools were visited, practically all of which were of the small rural type. A total of 2330 boys were examined. Out of the group, 179 boys were found to have definitely palpable spleens—a crude spleen rate of 7.7 per cent. The high rates were found in the counties farthest south and next to the Arkansas line, namely, Dunklin and Pemiscot with rates of 9.4 and 7.9 per cent, respectively. The largest number of boys with palpable spleens found in any one school was at Beech Corner School in Dunklin County, where 20 out of 75 boys were positive.

RELATION OF POSITIVE HISTORY TO PALPABLE SPLEEN

Of the whole group of boys examined 36 per cent gave positive histories; and of the boys with palpable spleens, about 58 per cent. In this connection it must be borne in mind that an enlarged spleen may represent:

(a) A residual from an inadequately treated acute case.

(b) A "scar" of repeated acute attacks.

(c) Evidence of chronic infection, perhaps contracted during the preceding season and at present dormant or asymptomatic.

Leaving out of account the error due to memory defect on the part of the school child, or his incompetence to answer correctly due to immaturity or low intelligence, many cases of negative history would be explained under (c).

In one or two schools where palpable spleens were found the history rate was less than 10 per cent, which borders on the negligible. As a general rule, however, the history of attacks of malaria during the preceding season indicated that a corresponding spleen rate would be found. The facts are graphically presented in a correlation table (Table I). The coefficient of correlation for the whole table is 0.411 (p. e. 0.005). This table is based upon only 101 schools. The individual groups are small and there is a considerable variation due to chance; but, in a general way, it would seem to demonstrate that a significant spleen rate is not apt to be found unless at least 23 per cent of the boys give a history of malaria during the preceding season, and the higher the history rate the more apt one is to find palpable spleens.

TABLE I—Showing Correlation Between Per Cent Positive History and Per Cent Palpable Spleen in 101 Schools Examined in Missouri, Kentucky, Alabama.

Per cent with Palpable Spleens	Per Cent Giving History of Malaria During Preceding Year								Mean Per Cent Positive Histories
	0-10	11-20	21-30	31-40	41-50	51-60	61+	Total	
0- 2	10	7	10	4	5	1	1	38	23.4
3- 5	1	3	4	3	1	1	1	14	30.0
6- 8	1	2	2	5	1	2	0	13	31.9
9-11	0	0	5	3	0	1	2	11	37.7
12-14	0	2	1	0	2	3	1	9	41.7
15-17	0	0	1	0	1	0	2	4	50.0
18-20	0	0	0	0	1	0	1	2	55.0
21+	1	1	0	2	4	1	1	10	39.0
Total	13	15	23	17	15	9	9	101	31.8
Mean per cent Palpable Spleens	3.3	4.8	5.2	7.4	10.3	10.0	10.8		7.3

In this same area, the Missouri lowlands, it was possible to compare the spleen rate of school boys with the history index of the whole population, obtained by house-to-house canvass. Nineteen schools were visited and examined in the area about Sikeston, which had been intensively studied by Dr. Mark Boyd, I.H.B., and Dr. Mark Ziegler, U.S.P.H.S., during the fall of 1921.[5]

The history index obtained by a house-to-house canvass of the whole area, 4506 persons, showed about 15 per cent of the population had had malaria during the summer of 1921. The crude spleen rate on 447 school boys drawn from the same area was 4.7 per cent.

To analyze the data a little more carefully, the area, which was 36 miles long and 12 miles wide, was divided into four zones, and each zone divided into a north and south half. The house-to-house canvass in the former was conducted by Observer A, and in the latter by Observer B. The resulting history indices are shown in Table II and compared with them are the spleen rates obtained from the school boys in the same zones. It is seen that

the variation in history rate indicated by the house-to-house canvass in the different zones is accompanied by a similar variation in the spleen rate. The time and expense required to obtain the history rate was infinitely greater than that required for a spleen index of the school boys.

TABLE II—Showing a Comparison of the Spleen Rate of School Boys with a History Index Obtained by House Canvass of the Same Population in the Sikeston Area of Southeast Missouri, 1921.

Area	History Index Obtained by House Canvass		Spleen Index
	Observer A 2570 Persons	Observer B 1936 Persons	Observer C 447 Boys in 19 Schools
Zone 1	31%	25%*	9%
Zone 2	10	7**	6
Zone 3	9	2	4
Zone 4	6	....	1
Total area	11.6***	14.7****	4.3

*Based on cases occurring up to September 15.
**Based on cases occurring up to October 15.
***Based on cases occurring up to time of canvass in August, September, October, November.
****Based on cases occurring up to time of canvass in August, September, October, November.

RELATION OF POSITIVE BLOOD SMEARS TO PALPABLE SPLEENS

The examination of 997 blood smears taken at random from 2330 boys in the schools of southeast Missouri showed a parasite rate of 4.5 per cent; of 138 smears from the 178 boys with palpable spleens, 28, or 20 per cent, were positive. Almost all were estivo-autumnal, but owing to the fact that the smears were taken in the late fall or winter, no conclusion is justifiable as to the association of this particular species of parasite with enlarged spleens. Failure to demonstrate the parasite in a single smear from many of the boys with palpable spleens is due to several factors—the scarcity of parasites in the peripheral blood, the fact that many are taking "chill tonic" or quinin at the time of the examination, and the fact that many are really cured of their infections, but exhibit the enlarged spleen as a "scar" of former battles. In other words, the spleen examinations revealed, in addition to those carrying parasites in their peripheral blood, many dormant or latent cases, and individuals who had suffered from repeated attacks.

Looking at the relation from the other point of view, of the 997 smears examined 58 were found positive. Of these 58 boys found to have parasites in their peripheral blood on a single examination, 29, or exactly 50 per cent, were found to have a palpable spleen by an entirely independent observation. In other words, one-half of the boys who had positive smears were picked up by spleen examinations.

On account of the small numbers it is not worth while to attempt to correlate the blood findings of a single school with the spleen findings in the same school. On the other hand, it is noteworthy that where a group of schools are considered together as in Table III, the spleen rate in this particular section shows a higher figure than the parasite rate, but there is no constant relation between the two.

AGE DISTRIBUTION OF PALPABLE SPLEENS

In the accompanying graph is shown the age distribution of the boys with palpable spleens, based upon the examinations made in southeast Missouri. It will be noted that the curve reaches its high point at the age of 9 years and thereafter declines, showing a sharp drop about the time of puberty. Among several hundred boys examined from the age of 16 on, no palpable spleens have been felt. Although this may be partly due to the greater difficulty of feeling an enlarged spleen through the developed abdominal wall and thick rectus muscle, it can by no means explain all. The enlarged spleen due to malaria in this Country is evidently much more commonly found in children than in adults.

RESULTS OF SPLEEN EXAMINATIONS IN OTHER AREAS

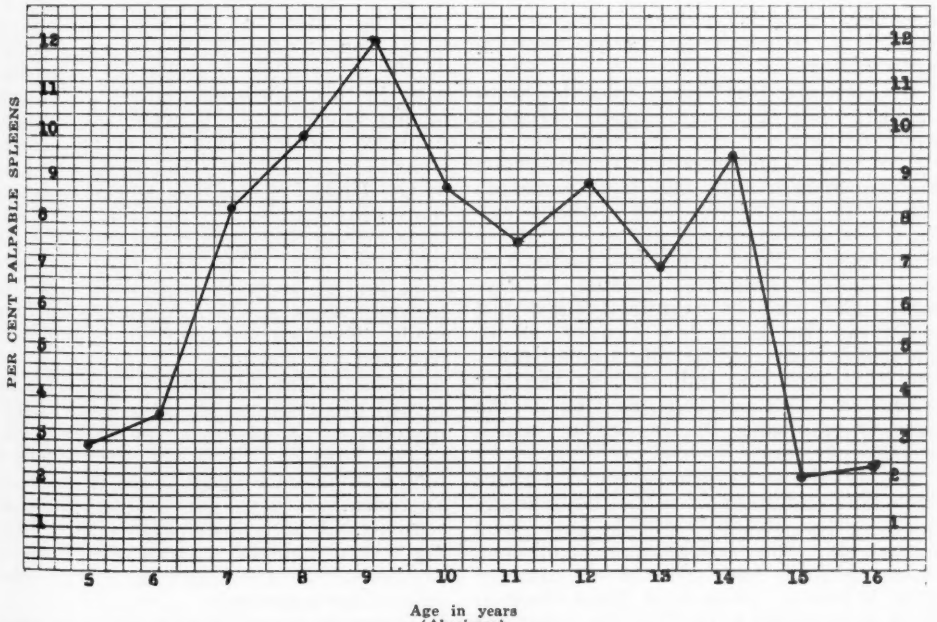
A summary of the results of these examinations conducted in southeast Missouri is shown in Table III. It is to be noted that in this particular section the spleen rate was large enough to be of value as an index to the amount of malaria present. Indeed, it yielded a figure appreciably larger than that given by the very much more laborious and costly method of blood smear examinations, and equally as valuable.

Since favorable results with the spleen examinations were obtained in this area,

an effort has been made to control and extend the observations in other areas (see Table III). In the first place, as a negative control, a "hill" county of Missouri known to have little or no malaria was visited and 84 boys in four schools examined. No enlarged spleens were found, and the absence of a significant history rate and of parasites in the smears examined confirmed the spleen findings.

TABLE III—Summary of the Results of Spleen Examinations of School Boys in Southeast Missouri, Compared with Similar Examinations in Other Sections.

State	County or Area	No. of Schools	No. of Boys Examined	Per Cent with Positive History	Per Cent with Palpable Spleen	No. of Blood Smears Examined	Per Cent Positive for Parasites	Month—1921-22
	Pemiscot	28	929	39%	9.4%	362	2.5%	Dec.
S. E. Missouri	Dunklin	27	890	30*	7.9	395	7.3	Nov.
(lowland)	Sikeston	19	447	37	4.3	183	3.8	Jan.
	Cape G.	2	64	56	4.7	57	0.0	Feb.
		76	2330	36%	7.7%	997	4.5%	
Missouri (highland)	St. Francois	4	84	5%	0.0%	21	0.0%	Feb.
Kentucky	Fulton	9	363	15%	4.4%	176	0.0%	Mch.
Southern	Jackson	6	305	15%	1.8%	143	0.0%	Mch.
Illinois	Alexander	11	609	26	0.8	124	0.0	
		17	914	23%	1.1%	267	0.0%	
Alabama	Houston	15	235	32%	4.3%	98	2.1%	May
	Escambia	28	532	....	1.3	390	1.0%	May



Graph No. 1.—Age distribution of boys with palpable sp leens, expressed as per cent of total of each age examined.

In other words, where malaria is absent an enlarged spleen in a school boy, due to other causes, is a rare finding.

Fulton County, in Kentucky, without doubt has the highest malaria prevalence of any county in that State and, judging from the death certificates, the malaria problem would be classed as a severe one. Only about 15 per cent of the boys examined stated that they had had an attack of "chills and fever" during the preceding season. With this low history rate, it was not surprising that only 4.4 per cent showed enlarged spleens. The figure proved again, however, to be of more significance than that obtained from the examination of 176 blood smears.

In southern Illinois, examinations were conducted in two counties—Jackson and Alexander. These counties are known to have foci of malaria, but their mortality reports do not indicate a severe problem. Despite the fact that 23 per cent of the boys gave positive histories, only about 1 per cent were found to have palpable spleens. Here the spleen rate is obviously too low to be of definite value. There may be a considerable error in the history rate in this instance, or this may be a section in which enlarged spleens are not found, although the disease prevails quite widely.

In Alabama, two typical counties were studied. The first was Houston County, which is known to have the highest malaria prevalence of any county in this State. Fifteen schools with 235 boys were examined in May of this year. About one-third of the boys gave histories of malaria last season. Four and three-tenths per cent showed palpable spleens. Ninety-eight blood smears examined showed 2 positives. In Escambia County, where malaria is known to be only a small problem, this fact was indicated by the low spleen rate, 1.3 per cent, as well as the parasite rate taken by Dr. Barber, which was 1.0 per cent.

Besides the observations recorded above upon large numbers of school boys, many more or less isolated schools have been visited in other counties in Alabama. Many children have also been examined in their homes. In general, these observations have tended to confirm the statement that in Alabama, where a serious malaria problem is present, one seldom fails to find evidence of the fact in enlarged spleens.

RESUME

In defining the field of usefulness of the spleen rate as a measure of malaria prevalence in the United States, there are two questions raised:

(1) Is the spleen rate a definite measure of the amount of endemic or chronic malaria in a locality?

(2) Is the spleen rate a figure sufficiently large to be of significance as an index of prevalence?

Concerning the first, the observations here recorded involve small numbers and are derived only from southeast Missouri in the late fall and winter. One-half of the boys in whose peripheral blood parasites were demonstrated, had enlarged spleens. Looking at the matter from this point of view, the spleen rate indicated just one-half of the actual malaria known to be present. On the other hand, of the boys with palpable spleens only 20 per cent were shown to be positive by a single blood smear. If every boy, or even most of these boys, were potential carriers of malaria infection, the examination of blood smears revealed only about one-fifth of the actual chronic malaria. The balance in this case seems to be on the side of the spleen rate. It would seem justifiable to conclude that under the conditions of examination in this particular area of the United States, the spleen rate was more nearly a measure of the endemic malaria among the school boys than was the parasite rate. That this does not hold true for all sections is indicated by the previous work to which reference has been made. Even at best the value is only relative and not absolute.

As to the second question, so far as recorded observations go, it is evident that in some areas, at least, the spleen rate among boys of school age *does* yield a figure sufficiently large to be of value as an index. It does not hold true for all sections. A high spleen rate may be lacking where malaria is known to be highly prevalent. Positive findings are of more value than negative.

There are many reasons for this variation. It is commonly accepted that the

administration of quinin has a considerable influence in preventing enlargement of the spleen. Accordingly, wherever the population is intelligent and receives good medical care, the spleen rate would probably be low; on the contrary, where there is ignorance, superstition and neglect and self-medication with inadequate "chill tonics," the spleen rate would be high. Again, the enlarged spleen is to some extent a measure of chronic or repeated attacks of malaria. A higher rate would be expected in a region where malaria prevails continuously year after year than in a section, previously almost free of the disease, suddenly attacked by an epidemic—such as so often occurs after the impounding of a water supply.

These same changing local conditions would cause the spleen rate to vary independently of the history and parasite rate. Local conditions and the large error of interpretation considerably affect the history rate by itself. The parasite rate varies with the season of the year, the technic of the examination, the size of the sample, and other factors. It is not to be expected that a constant ratio can be established between the spleen rate and the history rate on the one hand, or the spleen rate and the parasite rate on the other.

It also seems clear that in those areas of this country where there is a low incidence of malaria—where it is scattered about in small foci, as is the case in so many counties in the Southern states—the spleen rate of school boys will not be sufficiently large to be of significance. The method must, therefore, be limited to those areas where there is a large endemic malaria problem affecting the greater part of the population. In a later study an attempt will be made to indicate what counties in the several states have such a problem. Even in these areas of high prevalence in this Country it seems unlikely that there will be found spleen rates based on a large number of children as high as 20 to 30 per cent or more such as are commonly reported from tropical countries.

In the meantime, as a useful working hypothesis, experience shows that it is usually not worth while to examine the boys of a school for enlarged spleen unless 25 per cent or more give a history of "chills and fever" during the preceding season.

CONCLUSION

In certain areas of high malaria prevalence in the United States, the spleen rate of school boys is a satisfactory index of this disease.

REFERENCES

1. Ross, Sir Ronald: The Prevention of Malaria. John Murray, London, 1911.
2. Derivaux, R. C., Taylor, H. A., and Haas, T. D.: Malaria Control. Public Health Bulletin No. 88, 1917, p. 38.
3. Barber, M. A., and Coogle, C. P.: Public Health Reports 1921, Vol. 36, No. 14, pp. 706-710.
4. Barber, M. A., and Coogle, C. P.: Unpublished report.
5. Ross, Ronald, Christophers, S. R., and Perry, F. L.: Spleen Rate of London School Children. Ind. Jour. Med. Res., 1914, i, 385.

DISCUSSION

Dr. John A. Ferrell, International Health Board, New York, N. Y.—The determination of the prevalence of malaria, and its public health importance, are outstanding problems confronting public health administrators. Several methods for obtaining the malaria index of a community have been tried. They have been founded upon the anopheline density and the clinical manifestations of malaria, including personal histories, physicians' records, blood examinations, and spleen examinations. Spleen examinations have hitherto been used in tropical countries more than in the United States. If Dr. Maxcy and his associates can demonstrate that under our climatic conditions the spleen index is a reliable means for determining the incidence and importance of malaria, and that it can be economically employed, they will have made a most valuable contribution.

We cannot over-estimate the importance of having an accurate measuring rod for the amount of malaria in a community. The legislative bodies wish to know specifically the importance of the disease before appropriating money for its control, and they wish to know also whether or not expenditures made actually produce results. Moreover, it is important for the public health authorities to know whether or not the incidence of malaria in given communities is increasing or diminishing. Most of this information cannot be accurately collected unless we have at our disposal a practicable method for obtaining the malaria index.

I wish to express the hope that others who are in a position to do so, will conduct similar studies, so that those of us who are engaged in the administrative side of public health work may have at our disposal the guidance we so greatly need.

Dr. C. C. Bass, New Orleans, La.—The choice of methods for determining the prevalence of malaria depends very largely, it seems to me, upon the purpose we have in mind. If, for instance, we wish to learn whether malaria prevails in a community, without any special object of knowing to what extent it prevails, or

without any great degree of accuracy, we need not go to great pains to do so. If, on the other hand, we wish to know the total amount of malaria in a community, we have a very difficult (in fact, an impossible) job. There is no method or combination of methods by which we can go to a community and determine exactly how many people in that community have malaria. Blood examination fails to find all of the cases; the history fails to point out all of them; the history of attacks, as given by physicians, also fails; and spleen examination fails. We cannot, at present, find out the total number of persons who have malaria in any given group of people. Whatever we do is relative, and has only relative value, and the advantage of employing any particular method depends largely upon our purpose.

The question is, what application or use are we going to make of the results of our survey? If, for instance, we expect to sanitate an area, dealing entirely with questions of sanitation, it does not seem to me that it should be necessary to find all of the people in that area who have malaria. All we want to know is that there is a sufficient amount of malaria in the community to justify the effort and expenditure that will be required to control or reduce it.

If, on the other hand, we should include in the work to be done the treatment or cure of those who have malaria, we wish to find every case that we can. We then have to choose between three sources of information: history, blood examination, and spleen examination.

I believe it is the consensus of opinion, a generally accepted fact, that the spleen rate is not so high as the parasite rate or the history rate. Where we find one enlarged spleen we may find a variable but considerably larger number of positive bloods or positive histories.

One thing that should be said relative to the value of the spleen rate is that its reliability depends very largely upon the expertness of the examiner. Although those who are accustomed to making these spleen examinations become very expert and recognize an enlarged spleen without any difficulty, those who have not become so expert are unable to make anything like so reliable a survey. The same thing, however, can be said with regard to history taking. If several different ones of us should make a survey of a community and take the histories, there would be considerable difference in our records of positive histories. One would perhaps be more expert in recognizing the correctness of histories and possibly others less so. The intelligence of the people would also have a great deal to do with it.

The same thing applies to laboratory examinations. Not only must the examination be made, but it must be made by one who is expert, one who is competent to recognize the parasites and who is not likely to make the errors commonly made. Unfortunately, the examination of blood for malaria parasites is a difficult thing, and it requires a great deal of experience and practice in order to do it reliably.

It is my opinion that if we wish to determine the prevalence of malaria to the highest degree, we can do it best by expert or good history taking and by blood examinations. If, on the other hand, we wish to determine the prevalence of malaria in a general way, and where it is quite prevalent, we can do it perhaps as well by spleen examination, without the enormous expenditure of time and effort necessary in the other methods. If we are dealing with a region where malaria is less prevalent, and where it is mild in form, the spleen rate may be so low that it might not be so useful or so indicative as we might wish. On the other hand, in regions where the infection is heavy, it may be valuable.

In the spleen method we are also probably including a number of incorrect diagnoses. Malaria is not the only thing that causes enlargement of the spleen. That is not of great importance, however, because wherever malaria prevails to such an extent as to make us consider the spleen rate of value, it would so outnumber the other diseases that the errors in diagnosis would be negligible.

Mr. H. F. Ferguson, Sanitary Engineer, Springfield, Ill.—Illinois is in the elementary class in malaria control work, and I intended to sit here only as a listener and learner, and not make any remarks. But in the last paper some references were made to studies in southern Illinois, and Dr. Beach also referred to some work in southern Illinois.

Presumably you have all heard the expression, "Out where the West begins." Southern Illinois, where our malaria problem exists, may be considered the place where the South begins, or, if you are looking up the Mississippi, where the North begins.

We started this year, in Illinois, some malaria control work. Our time was limited before the work started, but we wished to obtain some figures of numbers of malaria cases to compare with future figures to show whether the work done during the 1922 season was worth while, and we obtained them by a house-to-house canvass. We shall make another survey at the end of the year.

If you obtain the number of cases by laboratory methods beforehand, and the number of cases by laboratory methods afterward, would you not obtain the same comparative results as by the history of cases from a house-to-house canvass? The history of cases was the quickest method by which we could get the information we wanted.

In order not to discourage some of the people who are working in the Southern states, I wish to call your attention to Dr. Beach's figures. He said that at Carbondale, Ill., malaria had been reduced from 456 to 31 cases. Apparently he has added the figures for 1920 and 1921 together to get the 456 cases and compared that figure to 31 for 1922. The Illinois Central Railroad makes speed, as you see. The correct figures from the house-to-house canvass in 1921 showed 267 cases, and our preliminary canvass in the first week in November showed 54 cases this year—in other words, one-fifth of the number that had prevailed the previous year. Possibly,

if our friends from Alabama and South Carolina had not been so keen on checking up each other, Dr. Beach would not have escaped so easily.

Our malaria control work has been possible only through the cooperation of the International Health Board, the United States Public Health Service, and the Lions' Club at Carbondale.

Referring to impounded waters for power purposes, is it intended to include power obtained from steam, in other words, boiler water? In Illinois we have not sufficient fall to our streams to produce water power, but we do have a large number of mines and factories that have water impounded for steam purposes, and these ponds are frequently mosquito breeders.

Dr. F. F. Russell, International Health Board, New York, N. Y.—Of course, it is foolish to go on making demonstrations after you have proved what you are trying to prove. It is now time to apply the knowledge gained. That is the second stage. The third stage is when the farmer is doing his own work and is cleaning up his own area. It seems to me that that is important enough to call it the third stage—when the people become interested enough to do their own cleaning up and anti-mosquito work. The state board of health has a direct interest in the larger projects, where the work is so extensive that no small community can do it, as when a state charters a drainage district.

There is one other thing I would like to say, which is brought up particularly by Dr. Maxcy's paper. That is, we are discussing in a general way two different things. We are discussing work on a broad scale for the prevention and control of malaria, and are, at the same time, discussing the very careful study of a limited area and a limited number of persons to find out exactly what the conditions are, with a view to using that knowledge in preparation for our wider control.

The preliminary measure is a careful, conscientious survey, and upon that you can go ahead and develop your larger plans. The first thing necessary is a careful survey, so that we can have accurate information, and only when we have that is it worth while to go ahead and do a big piece of work and spend a lot of money. If we are perfectly sound when we begin our work, we are bound to succeed. The work done by Dr. Maxcy is of interest. In different regions one has to use different methods, and in making a survey one can try the different methods until one finds the one most suitable.

Dr. Victor G. Heiser, International Health Board, New York, N. Y.—For the last three or four years I have had very little occasion to know much about malaria in the United States. My interest has been largely centered in foreign countries, but of course there are problems common to all countries.

The thing we find of the greatest difficulty is the method of arriving at conclusions, and if we continue studies in the direction of ascertaining more satisfactorily the true incidence of malaria it will simplify the problem very considerably. There are advocates of the method of depending upon doctors' calls, advocates of the parasite index, advocates of the spleen index, etc. Last year I attended a meeting in Java, during which one day was devoted to the question of how to make a proper spleen examination and the method to be used in recording the result. Some of the world's greatest authorities were there, but as no agreement could be reached the question was held over until another year. Therefore, it seems that if we can have more work of the kind done by Dr. Maxcy, it will be of great value.

Dr. M. A. Barber, U. S. Public Health Service, Brewton, Ala.—It seems to me an interesting fact that the spleen rate in the southern United States, even in localities where malaria is relatively abundant, is so low, as compared with rates we are accustomed to find in the tropics. The relatively low spleen rate in the southern United States is possibly due to a greater use of quinin, better living conditions, or to some similar cause tending to reduce malaria morbidity.

In our work we have found a house-to-house canvass useful in determining whether malaria is present to any great degree. All sick people, whatever the alleged disease, are sought out and blood specimens from them as well as from the healthy are examined for malaria parasites. The parasite rate thus obtained, while not, of course, representative of the whole population, is a useful index of the maximum rate obtaining at a given time. Possible yearly, as well as seasonal, variations must be taken into account whatever the method used in determining malaria prevalence.

Dr. Ennion G. Williams, State Health Officer, Richmond, Va.—So much has been said about the spleen index that I think it would be of value to have Dr. Bass tell us the other conditions in which the spleen is enlarged.

Dr. Bass.—Leukemias, anemias, Hodgkins' disease, typhoid fever, paratyphoid, etc.

Dr. L. D. Fricks, U. S. Public Health Service, Memphis, Tenn.—Is it not a fact that the diseases just mentioned can be easily differentiated from malaria by the average careful physician? Certainly, it seems to me, they should not be mistaken for malaria by a trained investigator who is making examinations for enlarged spleens due to malaria among school children in the Southern states. It is my understanding that kala azar is the one disease which the malaria writers stress as being easily confused with malaria, and, as we all know, kala azar is of extremely rare occurrence in the United States.

Dr. H. R. Carter, Assistant Surgeon-General, U.S.P.H.S., Washington, D. C.—What I do not know about the spleen index in America would fill a large volume. However, I must say this much. When we commenced, the reason why we tried to get an index for the measure of malaria was to determine the change in the amount of malaria as the result of control measures. We did not care to know how much malaria there was in 1913 in Roanoke Rapids, or in 1914, so long as our indices accurately showed the reduction. If our index showed only one-tenth of the malaria, but the same for each year, a comparison of the indices of the different years would give us an accurate knowledge of the diminution of malaria. In consultation with Dr. Rose and

von Ezdorf, in 1915, we accepted the number of physicians' calls as the index that we would take for the International Health Board work. The physicians' calls were to be counted the year they occurred. I understand recently that we have taken the physicians' remembrance of his calls, and that is a different thing. Our plan was to get them to keep an account of their calls this year and also next year, and to have our man take account of them every month.

The measures at that time available for determining the change of incidence of malaria were four: the spleen index, the blood index, the history index, and physicians' calls.

The small number of enlarged spleens found in proportion to infections—as determined by blood examinations—led us to reject the first, as any error in it would be too much magnified when it came to measure infections.

The blood index has the advantage (as has the splenic) of being independent of any errors on the part of the patient. Taken by the same man, with equal care and at the same time of the year, one blood index should be proportionately as accurate, or as erroneous, as another and the ratio between them should then accurately show the ratio between infections at the dates taken.

The history index is not considered accurate and yet two or more of them may be inaccurate near enough to the same degree for their comparison to give us a fairly decent idea of the change of the malaria incidence. This is not claiming a great deal. There is one thing to note and to discount in estimating its value. The history must be taken at the same time of year and cover the same number of past months. This will probably result in forgetting the same proportion of light attacks in both histories. If, as has happened, the first history is taken in the spring—when the work is begun—and the second in the late fall—when it is over—quite certainly a smaller proportion of these attacks, being more recent, will be forgotten in the second history than in the first and the reduction will appear less than has occurred. In general, reliability is thrown away if one history is made to cover more than one malaria season. Yet this has been done.

Why did we take physicians' calls as our comparative measure? As a measure, a measuring-rod, I mean, it confessedly varies more from the number of infections than the blood index. The same man may be seen in two attacks, or twice in the same attack if it be a severe one.

In 1915, we wanted to measure the good done, that is the injury averted, by anopheles control against the cost of such control, and also to use a yard stick that was not too costly to obtain. Obviously, in the measure of the injury caused by malaria one should consider not only the number of infections (blood) or of cases (history) of malaria, but the number of attacks as well and, as far as may be, their severity. Surely if a man has five attacks he is more injured than if he had one. If the attack be severe enough to call a physician, it is, presumably, more injurious than one in which a physician is not called. All three of these things, the number of infections (or of cases), of attacks and of the severity of the attacks, are factors in determining the number of physicians' calls. In addition, as originally planned, our agent getting the calls from the physicians' books each month, the data obtained was fairly accurate and not costly. Understand, I do not pretend that the physicians' calls take complete, or even fairly complete and comparative, cognizance of the factors making up the injury caused by malaria, yet they do take cognizance of them and thus it may be measure this injury as well as, or better than, would the spleen, blood, or history indices, and are certainly easier to obtain.

These last are obviously intended to compare the change in the number of individuals infected and do not pretend to take account of (1) the number of attacks per individual, or (2) the severity of such attacks, unless, indeed, numerous or severe attacks would be less apt to be forgotten in, and hence omitted from, the history indices.

This is the reason I urged this for a measure of the value of the work.

While no one would pretend that the number of physicians' calls is a measure of the malaria, yet, if you take the number before the anopheles work is done, and again after the anopheles work has been done, it will probably show approximately the amount of injury that has been averted. You can compare the amount of serious, injurious illness prior to the work and the amount of serious, injurious illness after the work.

If one wishes to get the best and most accurate comparative measures of the amount of malaria, I think the blood indices are the best. They do not give you all, but will probably miss the same proportion the first year as later. They are independent of errors of patients. The only objection is that they are costly.

While I think it may not be necessary to continue the physicians' visits index, I think at the time it was introduced it was the best index to the amount of injury that malaria was doing, and, therefore, the best estimate of the injury averted by anopheline control that we could devise.

Dr. Maxcy (closing).—A question was raised as to other conditions that cause enlarged spleen in this country. For our purposes, syphilis, tuberculosis and the splenic anemias are the conditions, besides malaria, which may give rise to enlarged spleen in children.

From our experience so far I think we can say that a spleen rate of not more than 1 per cent among school children is without significance. As it increases above 1 per cent, it becomes more and more useful as an indicator of malaria. When it is above 4 per cent, it is certainly useful for comparative purposes.

As to the question of the gentleman from Illinois relative to the value of a history rate obtained by house-to-house canvass, one has to bear in mind this fact: there is a large element of personal equation in any history rate depending

upon the individual asking the questions, the method of approach to the individual whom he is questioning, and the grade of intelligence of the population with whom he is dealing. If the same individual conducts the canvass in two successive years, using the same methods, the history index is of much more value than if a different individual had been employed each year. The greater the skill of the person in medical diagnosis, the more reliable the figure obtained will be.

As to the physicians' visits index, a recent experience is illuminative. When Dr. B. went to a certain town in Alabama to carry on research, he was told by the physicians practicing in that town that there was a great deal of malaria. He offered to examine blood smears taken from patients suspected of having malaria. Between January and August about 135 slides on such suspected cases were examined. Only about 6 per cent were positive after very careful examination of thick smear preparations. Now, Dr. B. was educating those physicians. They found that a good many of the cases they had been calling malaria were not malaria. Next year the number of visits which these physicians will charge up to malaria will be considerably smaller than that. If this is the index of control, it will show a remarkable drop, due to education. There are other errors which may be very annoying in using this index which need not be touched upon here.

Dr. Griffitts.—Did you use thick or thin smears?

Dr. Maxcy.—A thick smear was made on one end of the slide and a thin one on the other for the work in Missouri. Later, for the work in Kentucky and Illinois, a "drag" smear was used, essentially a thick smear technic.

"MAN-MADE" MALARIA*

By H. R. Carter, M.D.,
Assistant Surgeon-General, U. S. Public Health Service,
Washington, D. C.

Early in the work for the control of malaria our methods were entirely for removing such malaria-producing conditions as already existed. Very soon after that I saw that it was of very considerable, though not of so much importance, perhaps, to prevent the making of other conditions which would produce the anopheles and malaria. I found that there were quite a number of projects carried on for commercial improvement which were immediately producing malaria in malarial districts, the building of highways, the building of railroads, the impounding of water for power, either for power direct or for hydro-electric power, etc. They were making a good deal of what Dr. Fricks has called "man-made" malaria.

In the beginning of 1919, LePrince and I got the head man in Washington in charge of the good roads movement to put in certain specifications for the making of roads so that they would not make malaria. I have seen in Virginia, in Arkansas, and in other states roads that cost $5,000 and that would produce at least $1,500 worth of malaria. In 1919, specifications were put in which would prevent that, and which would make them put in culverts low enough; prevent leaving undrained borrow pits, etc. The specifications are all right, but they are not carried out. I understand that the same thing has occurred in North Carolina and in Arkansas.

LePrince and I took up the matter with the railroads during the War. We could do nothing with them when under private management. When they were handled by the Government, with McAdoo as supervisor, they agreed to the same specifications for new work. Whether or not they are carrying them out now I do not know. They did at Camp Meade and around the Quartermaster's Terminal and the naval base at Hampton Roads during the War. They did good and non-expensive work at both places.

As to drainage projects, some of you may remember the drainage done for Newport News. You would have supposed that a drainage project would prevent malaria and generally it does, but this one made it. There were perfect nests for breeding anopheles.

When Secretary of this Committee, I wrote on the matter to all the state health authorities, because those things should be under the state health departments. I left the United States then, going to South America, and I do not know what has been done except in two states. I know that South Carolina and Alabama have enforced legislation to prevent that class of malaria caused by railroads and by public roads.

*Read before National Malaria Committee, meeting conjointly with Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

Impounded water is a very difficult thing to handle. I cannot go into the discussion of that now, for I do not believe that I am supposed to speak here all day.

When you get a thousand horsepower from water power you have absolutely created it. You have made it out of nothing. During this fall I was in the states of North Carolina and South Carolina, and I think I can safely say that but for the water power furnished by the Catawba River five or maybe ten thousand employes of cotton mills would have been out of work. I believe that we should do all we can to encourage the use of water for power, but at the same time we should do what we can to keep it from being a nuisance. We can pay too much even for it. I believe that I have investigated more of these large ponds than any one else and have seen both the good and the harm that they have done.

I think a railroad can be prevented from making any new malaria and at small cost. The same is true for highways. Drainage projects can, practically always, be constructed so as to prevent more than they make, and I think that they generally do; but I do not believe that these large power plants can be made without making some malaria. I said a few years ago that the impounding of large bodies of water destroyed some malaria-breeding places and made others. The effect of impounding water depends upon three factors: (1) The proportion of anopheles production by the pond to that caused by it. (2) The location of the above productions. If it destroys breeding-places at a distance and causes others near residences, then it may increase the amount of malaria. Even a lessened production of the anopheles then may make—and sometimes does make—more malaria. (3) The changes in the biology of the mosquito. If impounding of water destroys the breeding places of a species that is not so injurious as the species for which it makes breeding places, even a lessened production may make more malaria.

I know of two ponds that I am very sure have destroyed more malaria than they have made, and another has destroyed at least as much as it has made; and yet all three have made, or increased, malaria in some places.

General regulations for governing impounded waters are difficult to make, because we do not yet know enough about it. LePrince, Griffitts and I worked on it for three years, but I cannot think that we have the matter in such shape that we can formulate general regulations for impounded waters yet. But we know enough, certainly, to reduce the amount of malaria caused by impounding water; to reduce it, say, by 60 per cent of what it would otherwise be, and that is gaining. The investigation is still going on. I myself recently have been over a project of the Southern Power Company not far from Charlotte, and for that area have formulated regulations which I believe will minimize malaria so far as economically possible. I use the adverb advisedly because when you require a dollar's worth of work and produce only eighty cents' worth of good—or, what is the same thing, eliminate only eighty cents' worth of injury—that is bad sanitation as well as bad business. But when you spend a dollar that will produce a dollar and a half's worth of malaria control, that is good sanitation as well as good business.

There is one thing about the making of ponds which I would like to say to the health officials here. We have investigated two ponds which are required by the United States engineers to be kept at a constant level. Nothing you can do to a pond with a constant level will prevent it from breeding mosquitoes. I suppose you might put a granite coping around it and sweep it regularly, but nothing else will do it. To my mind, when a pond is kept at a constant level nothing can be done but to move away from it or cut the dam.

DISCUSSION

Dr. L. D. Fricks, U. S. Public Health Service, Memphis, Tenn.—Early in 1919 Dr. Carter called the attention of the authorities in Washington to the importance of man-made malaria, that is, malaria due to the impounding of waters and to highway and railroad construction in regions at least potentially malarious. Dr. Carter stated at that time that he was not prepared to suggest regulations governing impounded waters, but suggestions relative to highway construction were prepared and sent to the Bureau of Public Roads and to all the health officers in the South.

When regulations for the administration of the Water Power Bill were being prepared at Washington during the summer of 1920, the Federal Power Commission requested the Surgeon-General of the Public Health Service to submit general regulations for the protection of the public health in connection with the development of these projects. It was felt that malaria and typhoid fever were the two diseases which should be considered in preparing these regulations, but that many of the new water power projects would be located in regions where neither of these diseases could easily become of serious sanitary importance. For these reasons it was necessary to draft the suggested health regulations on general lines and with minimum requirements in order that they might not interfere with the development of these projects instead of serving to protect the health of the people concerned as they were intended to serve. It is understood that the health regulations which were prepared and submitted to the Federal Power Commission have not been adopted and promulgated by the Commission. But this matter of regulating impounded water projects so that they will not become a menace to the health of the community in which they are located is becoming more and more important every day, as Dr. Carter predicted it would. Within the past few months I have received numerous letters from the state health officers in the South requesting suggestions from the Service for the regulating of impounded waters. In my judgment this matter should be given careful consideration by the health officers of the South and proper regulations should be prepared by each state health officer—not too stringent, else they will defeat the end we have in view by still further retarding the development of the water power in that state, but reasonable, practical regulations which will protect the health of the people during the transitional period (two or three years) of the impounded water project.

The United States Public Health Service has investigated impounded water projects located in the South in relation to malaria for several years and some of its most experienced field men have conducted these investigations, such as Dr. H. R. Carter, Mr. J. A. LePrince and Dr. T. H. D. Griffitts. I am sure, though, you will be glad to know that the Service has recently decided to conduct these investigations on a more permanent and continuous basis. Officers will be definitely assigned to the study of impounded waters in relation to malaria and will be continued on these studies probably for a considerable period of time in the expectation that we may be able to advise the state health officers of the South just what the dangers of increasing malaria by the impounding of waters really amount to and just what precaution should be taken in order to minimize these dangers.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

ACUTE GANGRENOUS OR PERFORATIVE AND SUPPURATIVE RETROCECAL APPENDICITIS*

By Jabez N. Jackson, M. D.
Kansas City, Mo.

I have chosen for discussion before you this morning the acute perforative or gangrenous and suppurative affections of the appendix, and my remarks will be confined to this generally distinctive type. To it, Dr. Deaver is said, some years ago, to have given the designation, "the bad appendix." Our early experience fully confirmed this designation through a distressingly high mortality rate. The observation, however, of certain facts in the history of these cases, with certain changes in our surgical technic, have given us satisfactory improvement in our results, that we deem possibly worthy of consideration.

The retrocecal appendix is of particular interest for several reasons:

(1) Because this anatomical position of the appendix is more common than is usually appreciated, and in this position, owing to certain anatomical features, it seems particularily prone to infections of the type under discussion.

(2) In this position the routes of extension of infection and the ensuing pathologic sequelae are quite different from those in the more normal anatomic position.

(3) With these changed pathologic extensions the symptoms are so different that to one not familiar or carefully observant the diagnosis may be overlooked or mistaken, with consequent unwarranted delay or neglect in the application of proper surgical measures; and

(4) The surgical measures applied require certain modifications to meet the conditions present.

According to anatomists, the appendix is found in the retrocecal position in 20 per cent of individuals. In the general or normal type, the appendix arising from the base of the cecum passes more or less downward and toward the midline of the body. It communicates thus with the general peritoneal cavity. The designation retrocecal, on the other hand, is given to those appendices which from the base of the cecum pass upward and backward to the outer side of or behind the cecum and ascending colon. This type is, therefore, confined to the lateral peritoneal fossa, outside the colon, and extends upward toward the kidney and liver.

ANATOMICAL VARIETIES

In our experiences we have observed four distinct anatomical varieties of the retrocecal appendix:

(1) The simplest form presents the usual mesentery and only differs from the normal in its position and course.

(2) A second variety passes upward, outside the colon beneath the peritoneum of the lateral iliac or lumbar fossa. It is without mesentery and is often, in fact, really retroperitoneal, its anterior half alone invested by peritoneum. Curiously, however, it is usually free at its tip above and there completely invested with peritoneum.

(3) The third type passes upward along the lateral wall of the cecum and colon, and its peritoneal covering is that of the colon wall. The half lying in contact with the gut wall likewise has no peritoneal investment. In this type we can readily see how an abscess may rupture into the gut and thus spontaneously evacuate and cure itself.

(4) Finally, there is a fourth variety, quite rare. In this instance the appendix passes upward directly beneath the cecum

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and ascending colon between the layers of the meso-colon, and is thus a true retroperitoneal appendix.

PATHOLOGICAL SEQUENCE

Practically speaking, there may be roughly considered to be two stages in the pathologic development of acute appendicitis:

(1) The stage in which the infection is confined to the appendix itself.

(2) The stage in which the infection breaks through the gut wall and is extended to surrounding structures, the peritoneum generally, or in certain instances the cellular tissues, or in rarer instances into the blood stream, particularly the veins.

In the first stage, the course of the disease is the same regardless of the position of the appendix. In this stage an excision of the appendix removes the entire focus of disease and a quick recovery is expected, with practically no mortality. Hence, there is the urgency of early diagnosis and early operation.

In the second stage come changes, particularly in the ensuing peritonitis and its extensions. In the normal type of appendix the general peritoneum is more or less exposed and its diffusion is the element of chief importance.

In the retrocecal appendix the peritonitis is primarily extended to the lateral or lumbar peritoneal fossa and is usually early confined by adhesions to this space outside the colon, which rather effectually shuts it off from the general peritoneum on the inner side of the colon. Its extension is henceforth upward to the outside of the colon toward the kidney and the under and posterior aspect of the liver. In occasional instances, when the infection reaches the hepatic flexure of the colon, it may pass forward beneath the liver toward the gall-bladder and an ensuing sub-hepatic abscess may develop. This may be mistaken for an empyema of the gall-bladder, or its extension.

More commonly the extension is upward between the diaphragm and the upper surface of the liver and there is a resultant sub-phrenic abscess. From this focus the infection may perforate the diaphragm and, involving the pleura, produce either a general or a localized empyema. Or in case of adhesion of visceral and diaphragmatic pleura, the abscess may enter the lung substance and produce a lung abscess, or break into a large bronchus and be coughed up. In our early experience we had one case of this type in which a large abscess broke suddenly into a bronchus, was coughed up and, inspired into the opposite lung, literally caused death by drowning the patient through his draining abscess. A second case of drainage through the bronchus was thereby apparently relieved and finally recovered.

Beside these peritoneal extensions, we have also to consider the extensions through the cellular tissue. This route of extension may occur either directly from a perforation of the retroperitoneal portion of the appendix in either type two or type four, or secondly from adhesion and necrosis with perforation of the posterior parietal peritoneum. We had two of these cases in which a bulging abscess presented behind the crest of the ileum and required simple incision and drainage with recovery. One other case was observed in which the infection penetrated the posterior muscular parietes, reaching the subcutaneous fatty tissues, with extensive cellulitis and abscess beneath the skin of the whole lumbar region and extended down over the buttocks and in the thigh, almost to the knee. This case died of septicemia, despite multiple incisions and drains.

One other case of retroperitoneal abscess we observed which was opened by a free lumbar incision. The perinephritic fat was destroyed and the kidney floated out of the wound. This case was operated upon in the country. Later the patient died and an autopsy was made. This revealed a further retroperitoneal extension across the spine to the opposite lumbar fossa, which presented another large abscess.

In the fourth type, the extension of infection is prone to enter the psoas muscle with more or less extensive destruction. The infection in this location is intimately associated with the origin of the meso-colonic veins and a septic thrombophlebitis occurs. Through this route the liver

is reached, with resultant liver abscess, generally multiple. Two such cases we have seen clinically and later observed at autopsy. In each case a gangrenous appendix of the fourth type was found. Likewise necrosis, in one case quite extensive and in the other localized, was found in the substance of the psoas muscle. In one, millions of small infarcts with early abscesses of the liver were the sequence. In the other, more advanced, two very large abscesses were found, one in each lobe. A third case of liver abscess, following this sequence, we were fortunate enough to localize, find solitary, drain and cure.

All of these varied complications were seen in our earlier experiences. They represent largely failure in early diagnosis with consequent neglect in operation. In part, however, they followed, we now believe, inefficient surgical treatment. In the past ten years these complications have not been seen.

SYMPTOMS AND DIAGNOSIS

In the interpretation of symptoms and in the correct diagnosis of these cases we believe that again our gross division of acute appendicitis into two distinct stages is helpful. The symptoms in the first stage are distinctive and are the same regardless of the position of the appendix and only varied by the intensity of the infection. These symptoms may be further differentiated into (1) the constitutional, or symptoms of infection in general; and (2) the special or local symptoms which point the way to the identification of the focus of infection.

(1) The constitutional symptoms are mainly elevation of temperature and pulse, general depression and blood changes, in these acute cases, represented by the leucocyte count. They are chiefly important (a) in proving that we have an infection process to deal with and not, for example, a simple colic; and (b) to indicate in some measures, at least, the intensity of the infection which may inform or warn us of the probable course and termination.

(2) The local symptoms call for close observation in the diagnosis of the retrocecal or other position of the appendix. The initial local symptoms of any acute appendicitis are gastric and epigastric as a rule: rather sudden onset of rather severe pain usually referred to the stomach or at least the upper abdominal region; more or less vomiting, sometimes persistent and severe. These with the infectious symptoms mentioned, constitute the characteristic onset of acute appendicitis and may be the only symptoms of the first stage.

The second stage, as we have noted, marks particularly the extension to the peritoneum and consequent peritonitis. With the approach of this stage there is commonly a group of symptoms indicative of peritoneal irritation or congestion which precedes actual peritoneal involvement and infection. This is marked by a more or less widespread pain in the lower half of the abdomen, with possibly some lessening of epigastric pain and gastric symptoms. With this pain and indicative of parietal peritoneal reaction is the appearance of general tenderness on pressure and abdominal rigidity. Thus far our pathologic processes and clinical symptoms are identical. From now on, with the onset of the true second stage, our extensions and our symptoms lead to divergence in the two types. The normal appendix, as we have indicated, communicates rather freely with the general peritoneum, including the parietal peritoneum, and in this type, owing to parietal peritonitis, the general abdominal pain, tenderness and rigidity persist until localization occurs, when they are prone to settle down as watchdogs over the local focus of infection underlying.

With the retrocecal appendix, the ensuing peritonitis is usually quite restricted and is quickly covered by adhesions of the cecum and colon to the lateral parietal wall. The general parietal peritoneum is thus not involved, except for a brief period. The signs of abdominal pain, tenderness and rectus rigidity may and do, therefore, quickly disappear. And on pressure on the anterior abdominal wall over the region of the appendix we will find little or no rigidity and little or no tenderness under pressure. Even deep pressure may elicit no tenderness. The cushion of gas in a probably distended

cecum prevents the pressure from reaching the infected and inflamed peritoneum sheltered beneath it.

When the appendix communicates with the general peritoneum, we can ordinarily later find when the peritonitis localizes, a tumor, partly the expression of a local abscess forming, sometimes the result of infiltration and edematous thickening of all the structures involved in the localization, parietes peritoneum, intestines, omentum, etc.

These similar processes which occur about the retrocecal appendix, however, are masked largely by the overlying colon. Sometimes a suggestion of fullness can be detected on careful palpation well outside the colon and toward the back. Sometimes nothing can be felt even under anesthesia. If, however, one will make deep pressure with the fingers above the crest of the ileum posteriorly and in the lumbar fossa one may elicit a very distinct, often severe, tenderness, totally unsuspected by the patient before search. The posterior tenderness on pressure is a valuable diagnostic sign when taken in connection with a proper antecedent history.

In the absence noted or in the rapid subsidence of the commoner symptoms, which are really those of peritonitis, the medical man is ofttimes much upset in his diagnosis. The signs of general infection (fever, leucocytosis and pulse disturbance) will still persist, but now often only confuse the diagonsis. Often a physician brings in a case with about the following remarks:

"Doctor, when I first saw this patient, I thought he had appendicitis. But in a couple of days all the symptoms of appendicitis were gone. His fever kept up, however, and I then thought he probably had typhoid fever. However, the course has not been that of typhoid fever and now I do not know just what is the matter, so I have brought him to you."

The proper diagnosis will require (1) an accurate detailed elicitation of the symptoms of the first twenty-four to forty-eight hours, which are of paramount importance; (2) an appreciation of the fact that the later signs of appendicitis are chiefly those of peritonitis, and that in the retrocecal appendix this peritonitis is confined to the limited space outside of and largely behind the cecum and colon; (3) the evidence of continued infection; and (4) the slight stiffness and the distinct tenderness on pressure above the crest of the ileum in the lumbar region.

TREATMENT

The treatment of retrocecal appendicitis as of appendicitis anywhere is surgical. Early diagnosis and early operation is of course indicated here as elsewhere. But we are not in this discussion considering cases reached by the surgeon at this happy stage. We are here concerned only with those which have passed on to gangrene or perforation with attendant suppuration and abscess formation. As a rule these, like others, are operated upon as soon as they come under observation. There is not here, however, the same acute danger as where general peritonitis is a threat. In certain types, therefore, we take time to load the patient up with glucose and bicarbonate of soda, by proctoclysis and hypodermoclysis to develop an alkaline reserve, wash out the stomach (by lavage) and colon (with enemata alone) to get rid of gas and lessen the dangers of post-operative intestinal paresis. We thus may convert an apparently very sick patient presenting great surgical risks into one able to meet his ordeal readily. This delay does not mean more, as a rule, than twenty-four hours.

INCISION

We have found the McBurney incision to give us the best access to these appendices. Usually it requires extension by a free incision of the muscles backward to give adequate exposure, particularly if the appendix runs up high toward the liver. The straight outer rectus incision throws us too far to the inside of these appendices and exposes the general peritoneum to infection. After free incision we find ourselves in the free peritoneal cavity with no adhesions to the inner side. Before attempting to enter the abscess the general cavity is thoroughly protected by hot moist gauze packs placed over to the inner side of the colon throughout the length of the wound. Then with the index finger hugging the lateral parietal wall we bear down between it and the colon or cecum and thus reach readily the abscess. Mopping out the pus cleanly, all

adhesions to the lateral parietal wall are freely separated and the colon is thus mobilized from the lower end of the cecum upward as far as necessary. We are thus able to see pretty well the field of involvement. In all cases we aim to get the appendix and remove it *in toto*. We can usually find some normal appendicular structure, either at the base or at the tip, from which known structure we begin our enucleation.

In only a few instances is there complete gangrene without recognizable structure of an appendix left. Sometimes the surrounding tissues are so infiltrated, thick and hard that recognition of the appendix is difficult. But somewhere, if our exposure is adequate, we will find recognizable ground for a start. Vessels are clamped as developed. When the appendix runs along the colon wall (as in Type 3) great care is required to avoid a tear into the gut.

After freeing the remnants of the appendix we endeavor to find a healthy base for ligation in order to obviate the chance of a subsequent fistula. For similar reasons the raw area and the stump are covered as completely as possible by sutures extending into normal peritoneum on either side. The colon will tolerate considerable infolding and with experience it is rather remarkable how complete a peritoneal covering of extensive raw surfaces can be obtained.

The next step constitutes the one which in our experience has spelled the difference between high and low mortality. This is that of proper drainage. With the body in the horizontal position there is quite a basin above the crest of the ileum in the lumbar fossa. A drain passed simply down to the base of the appendix does not reach and drain this basin. In one of our early cases, drained through the anterior wound in the usual way and drained apparently well, we found our patient still maintaining a septic course. After a morning dressing with supposedly careful cleaning under irrigation, in reaching under the loin to lift the patient for removal of a Kelly pad we, to our surprise, pressed out thus over a half pint of pus retained behind in this basin. This led us to make a free lumbar stab and introduce a large rubber tube of one inch diameter for drainage of this area.

With the finger, through the anterior incision, we can locate this lowest spot above the crest of the ileum and then stab through a counter wound adequate for the tube drain. With a pair of forceps passed from behind into the cavity and out through the anterior wound, the large tube is seized and drawn through until its inner end is left just above, flush with the peritoneum of the fossa. It should not project too far inside lest it press against the gut and by pressure necrosis induce a fistula. After placing drain properly it is fixed by a suture of silkworm gut. This simple experience revolutionized our results. Many of the disasters mentioned earlier in our discussion had followed operation as then done and our mortality had been over 25 per cent. Since the routine introduction of this method of drainage it has been reduced to almost nothing. In looking up the results in one of our services for the last five years we find, in this one series alone, sixty-seven cases of this type with but one death. This death was from nephritis in a case brought in from the country and operated upon at once to accommodate the family doctor, who wanted to get home on the next train. This is the only death we can recall in our five years' consecutive experience. Most of our disasters were before our knowledge or use of the Fowler position. Perhaps this position alone might improve ordinary results, but we do not believe so to the extent we have secured by such drainage with the ordinary recumbent position. It is the point in technic, therefore, upon which we wish to lay stress.

After installation of lumbar tubular drain, a cigarette drain is introduced at the lower end of the incision down near the apex of the cecum. When the perforation takes place at the base of the appendix, which is at the crest of the drainage divide between the lumbar basin behind and the pelvic basin below, it is well to recognize that some of the leak may spread also into the pelvis. In this instance, after cleaning out the pus in the pelvis, the cigarette drain is carried down to the floor of the pelvis. The remainder of the incision down to the drain is then

sutured in layers, muscle aponeurosis and skin.

Finally it is of value to remember that during our operative manipulations the parietal wound has been exposed to considerable infection and that necrosis of fat and fascia are frequent. To lessen the extension of such infection and thus to save the integrity of our abdominal wall, we order the immediate institution of continuous hot fomentations applied directly to the wound. Moist heat increases exudation, lessens absorption and enables us to lessen and in some instances entirely to avoid extending infection and fascial necrosis. It thus shortens convalescence and lessens liability to weak walls and subsequent hernia.

DISCUSSION

Dr. Richard A. Barr, Nashville, Tenn.—I fully agree with Dr. Jackson except on one point. He did not say so definitely, but I inferred that he rather inclines toward drainage of the peritoneum. My idea of the difficulty in this retrocecal type of case is that you so frequently have a retroperitoneal infection, for even where the appendix is not primarily retroperitoneal, in getting at the appendix for removal you open into the cellular tissue. In the case of the appendix that has a definite mesentery, though it lies to the outer side of the colon, it can be removed without any injury to the posterior parietal peritoneum and the post-peritoneal cellular tissue is not subjected to infection. If the appendix is intraperitoneal and can be removed without opening into post-peritoneal tissue it is not my custom to use any drainage at all. I do not attempt to drain the peritoneum unless I have an unclosed perforation, or unless I anticipate one, but always in these post-peritoneal infections I do put in drainage, and put it in as does Dr. Jackson. If I am able to recognize a retroperitoneal abscess I open it posteriorly for drainage purposes only. If I am unable positively to recognize retroperitoneal involvement, I open anteriorly. The trouble with anterior drainage is that the posterior parietal peritoneum drops together after the operation and you drain in front of that while your retroperitoneal infection continues. If you are careful about putting in drainage from the front, and see that it extends into the retroperitoneal space, it will be satisfactory. The lumbar drain that does not have to drain across the peritoneum anteriorly is the proper one. Dr. Jackson did not say whether he put in an anterior drain in addition to the lumbar stab. I personally put in the posterior drain and close anteriorly throughout. Some of the wounds heal primarily and some develop infection, though I feel sure that this is less common and the infection less severe than when an anterior drain is used.

Dr. Stuart McGuire, Richmond, Va.—I am glad to hear a discussion of appendicitis again on the floor of a surgical meeting. Time was when it occupied a frequent place on our programs, but recently we have treated the disease like a poor relation, although the fact is it gives us a large proportion of our income. Appendicitis is as frequent as it ever was, and the mortality is higher than most of us realize. Some surgeons operating under favorable conditions are able to report large series of cases with marvelously few deaths, but an examination of all available reports of hospitals in the United States shows that today the mortality is 10 per cent. This is not of the acute cases, but of the acute and chronic as well.

There is no longer any question of whether to operate for appendicitis or when to operate for appendicitis; but there is room for discussion of how to operate for appendicitis, because the method employed depends upon the nature of the case. Dr. Jackson has called our attention to a common and very fatal type. I divide cases of appendicitis into four groups and try to assign a patient to one of these groups before I operate: first, chronic appendicitis; second, acute appendicitis; third, acute appendicitis with diffuse peritonitis; and last, appendicitis with localized abscess. An abscess the result of appendicitis in some instances is adherent to the abdominal wall and may be opened and drained without going into the peritoneal cavity. The kind described by Dr. Jackson, however, is behind the peritoneum and can only be reached by opening the peritoneal cavity. This type gives us a large mortality, not, as the Doctor said from peritonitis, but from septicemia. My plan has been to wall off with gauze, separate the cecum and open the abscess, remove the gangrenous appendix, sponge out the pus and drain anteriorly (gauze and rubber tissue). Drainage is the keynote of success and the effectiveness of the drainage determines the fate of the patient. I realize that in an uphill fight we need a down-hill drain, and Dr. Jackson's suggestion of using a tube introduced through the loin is based upon sound principles. I have never practiced the method, but shall bear it in mind when I have such cases to deal with in the future.

Dr. Francis LeS. Reder, St. Louis, Mo.—One fact the Doctor did not mention, and it is not mentioned very often in connection with retrocecal cases in this type of lesion: we mean those cases that have not the help of the peritoneum, the patient's greatest asset during an attack of appendicitis, and that is the attack upon the abscess through the rectum. I assume on account of the mention of drainage that we have to deal with pus. In operating upon these cases, as Dr. McGuire has said, we should spare the abdominal cavity. Opening with drainage through the rectum, provided your examining finger is sufficiently educated to detect swelling and fluctuation, will give 50 per cent of success. When recovery has taken place and the subsequent removal of the appendix, i. e., what is left of the appendix, is deemed advisable, it can be done in the usual way.

In speaking of the peculiar conditions that may arise through appendix lesions, let me cite one case in which a patient nearly died through my carelessness, not my ignorance. It was a retrocecal appendix lesion with an abundance of chocolate colored fluid in the abdominal cavity. The Kocher incision was made—as a precautionary measure a suprapubic opening for drainage was also made. On the fifth day the right epididymis began to swell and caused great pain. I looked for a venereal lesion, which was not there. It was found, however, that the pus had burrowed along the cord into the scrotum, infecting the cellular structures and producing a large abscess in the scrotum.

Another form of pus burrowing reveals the infection near the hip joint. This usually happens when a patient is thought to be convalescing. These are the cases that are not infrequently diagnosed as "hip joint" troubles.

I cannot impress upon you too forcibly the desirability of keeping this subject of appendicitis actively before you. It is one of the most frequent forms of disability we have and the mortality is still much too high.

Dr. R. M. Harbin, Rome, Ga.—We all know that the postcecal type is the bugbear in operating for appendicitis and the difficulty of diagnosis is a great handicap. I am glad Dr. Jackson stressed the first twelve hours of the history, for we slip on that failure so often.

There is only one point that I wish to bring out, and that is the diagnosis of this type of case. We do not have the local tenderness and in the presence of positive urinary findings the diagnosis is much more confused. There may be the retrocecal appendicitis plus pus in the urine and other urinary findings and then one must be on the alert to make the distinction, as there may be a coincidence of these two pathological conditions. Three points in the diagnosis always help even in the presence of positive urinary findings. First, the initial nausea, and second is the retraction of the thigh, which points to a septic inflammation about the muscle, and the third point is the increasing leucocytosis.

Dr. James T. Wolfe, Washington, D. C.—How many times have I seen men use a large cigarette drain, pull it out and plug in another for twenty-four hours. Only after its removal will pus discharge and then they plug up the incision again. It has been my practice to use a large rubber tube, nearly an inch in diameter, and also to have eyelets in the lower end of the tube. It is this type of case that has caused me to discard the gridiron incision entirely in appendicitis. The right rectus incision gives an opportunity for better approach. The gridiron incision will give more post-operative hernias than the right rectus in pus cases because we have in the right rectus a muscle that is highly resistant to infection, whereas fascia has low resistance due to poor blood supply. It has been my practice, if I find the omentum adherent, to work to the outer side of the colon, tracing down to the appendix, and if I find it retrocecal, I have not invaded the peritoneal cavity because it is walled off. I drain through the right rectus. Another feature is that you can drain more effectively by turning the patient on the right side.

Dr. Jere Crook, Jackson, Tenn.—If we have the symptoms referred to, especially the rigidity with the effort of the upper peritoneum to come to the rescue, it means that we have peritonitis. That feature appealed to me especially. Another point is that with right rectus rigidity I make the incision low down near the iliac bone and use the gridiron incision about one inch from the bone. If you make the low incision you have access to the cavity you are trying to drain. If we put in a tube, cutting out a U-shaped section, and put that down underneath the colon, it is possible to get all the drainage needed in every instance. I do not use a cigarette drain in pus cases, as it serves simply to retain the pus instead of evacuating it.

Dr. Jackson (closing).—I am not talking about early diagnosis in these cases. These are all cases that came in after suppuration and gangrene had taken place. However, if we will recall some of these facts presented it may be possible to get an early diagnosis. If you understand this there are certain things that are characteristic. We must keep in mind the various pathological sequences that may ensue, for they are not all the same. These are all drainage cases and this must be remembered. You may say that this simple point of drainage does not amount to much, but it reduced my mortality to nil from 50 per cent. I have no more fear over a retrocecal appendix today than over a clean abdominal case.

Incidentally, I wish to say that in all cases I take the appendix out. I never simply open and drain an abscess, for if I do I leave an old infected organ that may give rise to secondary infection. In one case in which the appendix was not removed there was an abscess which spread over to the opposite side and the patient died.

In type three, where the appendix runs right along the side of the gut, in taking it out you are digging into the intestinal wall and it is easy to tear the colon wide open unless you are careful. If you put a drain down somewhere near the bottom of the infection you will get a fecal fistula. I put the drain in the back and do not let it stick up at all, and then I make no other drainage and there is no contact with this mass of infected tissue and we never know what a fecal fistula is. I think, as Dr. Crook said, that we get better drainage if we make the McBurney pretty well out. It makes no difference if you cut the muscle, for you get more space. I have seen cases where the appendix ran clear up between the liver and the diaphragm, but if you get it out and put drainage in the cavity you will have no trouble. The spreading cellulitis that the Doctor mentioned as occurring along the fissure is prevented by this posterior drain. I think you get less of that as you go farther out. The outer side is a well vascularized muscle and not nearly so liable to slough.

TRANSFERENCE OF THE CREST OF THE ILIUM FOR FLEXION CONTRACTURE OF THE HIP*

By Willis C. Campbell, M.D.,
Memphis, Tenn.

Flexion contracture of the hip joint, if above 60 degrees, renders the extremity practically useless, and when both limbs are affected the individual becomes a quadruped, as walking in an upright position is impossible. Lordosis may compensate for 45 degrees flexion, but causes a continuous strain on the spinal structures, and the entire skeletal system is out of balance. This deformity may occur through various etiological factors, but infantile paralysis is more frequently the cause. In the foot, ankle, knee and other parts prevention of deformity has, for many years, been urgently advocated and strictly carried out by the orthopedic surgeons, but such measures are enforced with difficulty in the hip joint. When the affected child or adult lies in bed during the acute stage the flexed position of the knees and hips is more comfortable and may actually relieve pain. The hips, by gravity, become abducted. If there is a loss of muscle balance by paralysis of the adductors and extensor muscles of the hip, the active flexors and abductors are gradually contracted until the position becomes fixed. Any mechanical or surgical procedure to correct must take into consideration both factors, flexion and abduction.

Subcutaneous tenotomies and fasciotomies for flexion deformities of the hip joint are most unscientific and haphazard. Structures are blindly severed, and later, torn and traumatized, when the hip is forcibly extended, the space between the severed surfaces is filled with blood clots which later organize into fibrous tissue, renowned for subsequent contracture. The object of these measures is rarely accomplished. The deformity is not over-corrected, which factor is essential for permanent success in the management of all deformities. Relapse to some extent occurs as soon as walking and sitting is permitted, which positions are obviously conducive to recurrence.

Dr. Robert Soutter, of Boston, has described an excellent reconstructive operation, along anatomical lines, for flexion deformities of the hip, the essential points of which are as follows:

(1) An incision is made parallel to the line of the femur, one and one-half inches posterior to the anterior superior spine, extending two inches below and two inches above.

(2) The tough fibers of fascia lata, extending from the top of the trochanter to the anterior superior spine, are severed.

(3) The anterior superior spine is exposed, an osteotome strips the periosteum from this structure, peeling it away from the crest, extending two inches backward to the inner and outer side. The periosteum, with muscles attached to the anterior spine, is removed downward to below the anterior inferior spine.

(4) The hip is hyper-extended and held in this position by plaster or apparatus.

This method is a decided advance when compared with any employed in the past and we have had many gratifying results, but have frequently been unable to reduce abduction. Usually the hip can be extended, but not with the limb parallel with its fellow of the opposite side, which is due to a shortening of the abductors. This problem we have combated by a modification of and an addition to the Soutter operation, which is of enough advantage to warrant description. We have in our routine used this technic for the past two years, during the last nine months, since January, 1922, in over 30 cases. The results have been 100 per cent successful and especially valuable in quadrupeds from infantile paralysis, frequently seen in the South. Many of our cases are from rural districts where the prevention of deformity is not so well carried out as in more densely populated areas, and where the physician has more ready access to his chronic patients. We have found the procedure not alone of value in contractions of infantile paralysis, but also in infectious arthritis, hemiplegia, spastic paralysis and congenital dislocation of the hip in older children, when abduction could not

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

be relieved, thus avoiding osteotomy. Our technic is as follows:

The skin is incised along the anterior one-half or two-thirds of the crest of the ilium to the anterior superior spine and then downward to the outer aspect of the

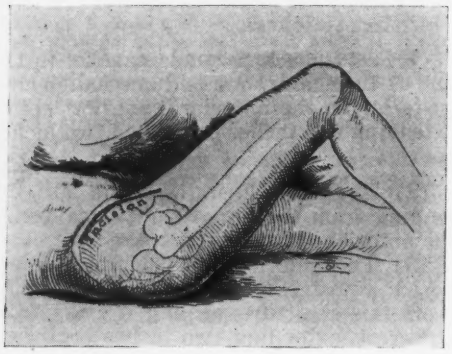

Fig. 1.—Skin incision.

rectus muscles for about two or four inches, a typical Sprengel approach to the hip, recently advocated by Smith-Peterson. The superficial and deep fascia is incised to the crest and anterior superior spine. With a sharp osteotome the ante-

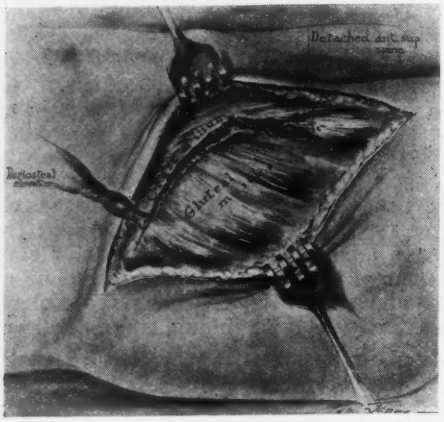

Fig. 2.—Gluteal muscles with small portion of crest of ilium being detached.

rior superior spine is removed. The outer one-fourth of the crest is chiseled through, from before backward, or the anterior two-thirds, or the entire crest, as the occasion demands, after which a heavy osteotome peels the entire mass, subperiosteally downward to the rim of the acetabulum, above which a tract of bone is denuded about one inch in diameter and parallel with the crest of the ilium. The raw sur-

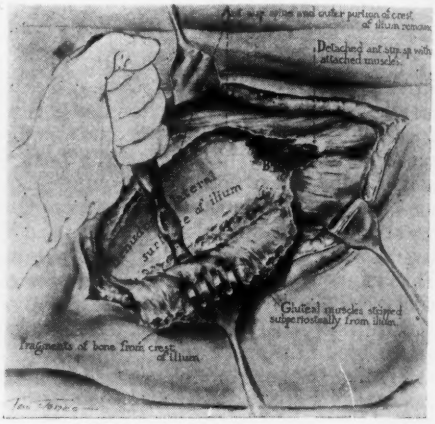
Ant. sup. spine and outer portion of crest of ilium remain
Detached ant sup sp with attached muscles
Gluteal muscles stripped superiostally from ilium
Fragments of bone from crest of ilium

Fig. 3.—A. Surface of bone roughened to facilitate new attachment. B. Surface of bone between anterior superior and inferior spines roughened for new attachment of flexor muscles.

faces of the transferred crest of the ilium and anterior spine fall, by gravity, so that raw bony surfaces approximate. If this

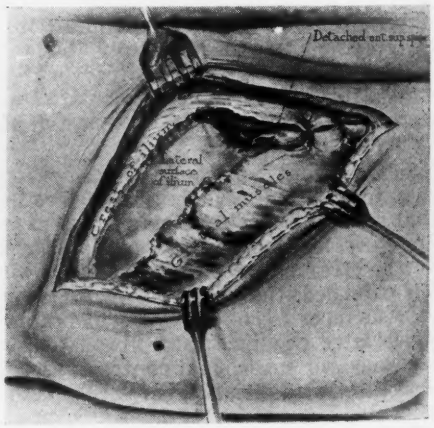

Fig. 4.—Ready for closure. Gluteal muscles dropped into new position, and fascia partially closed over detached anterior superior spine.

does not reduce flexion, the anterior structures, such as psoas, fascia or capsule of the hip joint may be easily attacked. The

superficial fascia above is stitched to the deep fascia, at a point below, bringing the skin incision about one inch below the crest of the ilium, avoiding possible pressure. The skin is closed with dermal sutures.

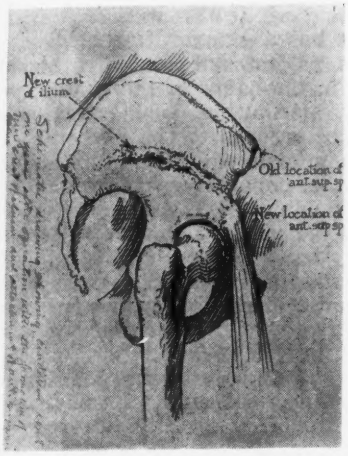

Fig. 5.—Schematic drawing showing condition about one year after operation with the formation of a new crest of the ilium and attachment of the anterior superior spine.

Plaster cast is applied in hyperextension, which remains eight weeks. We have had no fatalities and there have been no alarming symptoms. In from two to three

Fig. 6.—Extreme hip flexion contractures prior to operation.

months a massive bony ridge can be found, along the line of attachment of the new crest. Hence the operation is designated "transference of the crest of the ilium."

In order to illustrate the type under consideration, though practically all hip contractures are amenable to this procedure, one case will be briefly narrated:

Fig. 7.—Front view of the same case after transference of the crest of the ilium.

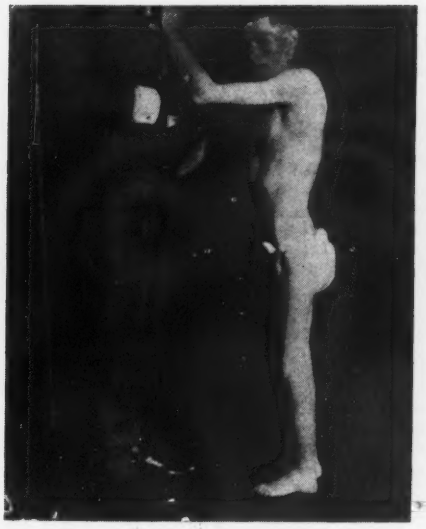

Fig. 8.—Side view of the same case after transference of the crest of the ilium.

Case I.—A boy, Clarence Wheeler, age 18, when two years of age had infantile paralysis, causing an extensive paraplegia with flexion of both knees, calcaneovalgus of both feet, and extreme flexion and abduction of both hips, so that he was

unable to progress even as a quadruped. His method of ambulation was on both hands and buttocks. He was a human tripod or "triped," if such a term is permissible. The feet and knees were corrected by operation, a description of which is irrelevant to the subject in question. On each hip the crest of the ilium was transferred as above described, completely correcting the deformity, as shown in the illustration.

869 Madison Avenue.

DISCUSSION

Dr. Lawson Thornton, Atlanta, Ga.—In Atlanta we see a good many cases of infantile paralysis with varying degrees of flexion deformity at the hip, and have in almost all cases been able to correct this contracture by the operation devised by Dr. Robert Soutter. However, in a small number of cases this procedure alone has not been sufficient. Two cases required osteotomy of the femur to completely overcome the deformity.

The operation which Dr. Campbell has presented to us will be of great value in the treatment of this extreme type of hip flexion deformity.

Dr. W. B. Carroll, Dallas, Tex.—I had the pleasure of seeing in Dr. Campbell's Clinic a few days ago several cases operated in this manner, and also saw him do one operation. The technic is simple and the correction after incision had been made was much easier accomplished than similar cases done with the Soutter. I have been accustomed to doing these severe cases in two stages, leaving the thigh in ten or fifteen degrees flexion for ten days, then placing it in plaster in hyperextension. One should be careful in making a radical change in position of leg on account of the possible damage to the femoral vessels. This would apply in Dr. Campbell's operation as well. The advantage Dr. Campbell has is gained by releasing the gluteus medius, which is undoubtedly in an important structure in the flexion and abduction deformity.

Dr. Robert F. Patterson, Knoxville, Tenn.—Dr. Roberts, of New York, strips down the gluteal muscles from the ilium in the treatment of the so-called gluteal myositis.

I wonder if Dr. Campbell would get the same result by stripping off the muscles as by chiseling off the crest of the ilium?

Dr. Campbell (closing).—We are using this operation routinely in practically all contractures of the hip. There have been no complications and no fatalities, as we accomplish a definite procedure based upon proper mechanical principles. I believe that the removal of the crest with the attached outer one-fourth and denuding the dorsum of the ilium gives an attachment of the muscles which is more firm than if simply severed and left loose in the soft tissues. Also that bony union between these points makes subsequent contracture impossible, whereas this might often occur if the muscles were loose in the soft tissues. There is no interference with blood or nerve supply, the attachment is simply transferred to a point below correcting the deformity and in no way inhibiting physiological muscle action.

THE TREATMENT OF CARCINOMA OF THE BLADDER*

By William Neill, Jr., M.D.,
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It is but a comparatively short time since a patient suffering with hematuria rested in the hands of the general practitioner, attributing such remissions as might be enjoyed to the medicines which were administered. Great stress was laid upon the importance of examining the urine to determine the source of the bleeding. If the blood was bright red, the lower urinary tract was responsible, while if the blood was intermittently mixed with the urine or ureteral clot-casts appeared, the kidneys or ureters were held guilty and appropriate medication was prescribed. For two decades cystoscopy and the ability to examine the bladder, ureters and kidneys has altered not only all former methods of diagnosis, but methods of treatment as well, and the treatment has become direct, purposeful and aggressive.

Of the various causes of blood in the urine, bladder tumor is the commonest. No more distressing condition, from the patient's standpoint, is met with than tumor of the bladder, and no other condition offers greater difficulties from the standpoint of effective treatment. The condition is met in all periods of life, but as is the case with all tumors, it is more common after middle age. The course is prolonged and the tendency is for the condition to remain confined to the bladder, although metastasis to the pelvic bones may occur early, and for that reason an x-ray plate of the pelvis should be made in all cases before treatment is begun.

The first operation for tumor of the bladder was done by Warner, in 1747, through a lateral perineal incision. Simon, in 1875, removed growths from the female bladder through his urethral specula. In 1814, Billroth first operated successfully upon a bladder tumor from above, and later the suprapubic route was made popu-

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lar through the insistence of Guyon. Operating through the vagina into the bladder was done thirty years ago. Franz, in 1880, advised the total removal of the bladder, and twenty-five years later, in 1905, Watson advocated the complete removal of the bladder in all cases of cancer where the disease was confined to the bladder itself. Deliberate, systematic operations for tumors of the bladder scarcely date back thirty years.

The etiology of this condition, as with new growths elsewhere, is not definitely established. Some contend that in a large percentage of cases there is a history of chronic cystitis, or stone, or some form of long standing bladder irritation. In our experience we have observed this in a comparatively small number.

Despite the notable advances in surgical technic during the last decade, the treatment of carcinoma of the bladder continues to occupy a prominent place in the thoughts and problems of the urologist. The results of all incisional forms of treatment in the past have been so discouraging as to make bladder tumor cases unwelcome in the practice of urology, and not infrequently altogether to preclude conscientious surgical intervention. The results following the excision of tumors, whether it be local removal or a complete cystectomy with transplantation of the ureters, have been far from brilliant. Up until the past eight years it was generally accepted that for a cure, a wide and clean excision offered the best method. The routine surgical removal in carefully selected cases, which at its best is dangerous and difficult, shows recurrences in from 75 to 80 per cent and that the operative mortality is high.

Before instituting treatment all data should be well in hand, any complicating disease should be discovered, and its relation to any proposed line of treatment considered. The kidney function should be determined, as the cause of death is usually from uremia with infection of the entire urinary tract and not primarily from the disease itself. Any patient with a history of bladder irritation and hematuria should be examined with the cystoscope. For many years at our clinic the open air cystoscopic technic of Dr. Howard A. Kelly has been in daily use. It is convenient, rapid, and affords direct information as to the bladder surface and allows the widest range of manipulating procedures within the entire bladder. Although Dr. Kelly demonstrated the possible use of this method in males as early as 1893, it was not employed by urologists for the male, and we ourselves had for years used only one or the other of the various modifications of the lens system water cystoscope. While painless and best in females, it is not so convenient in males. An exaggerated Trendelenburg posture, with the head of the table lowered to an angle of 60 degrees, as advocated by Dr. Georges Luys, of Paris, gives a very effectual air dilatation to the male bladder in all except contracted irritated bladders and very fat subjects. In these a general anesthetic will usually give the desired results. This method presents incontestable advantage for seeing these tumors in their actual state and in determining their number, position, size and relation. A characteristic and definite clipping can easily be taken under direct vision for microscopic study. This method of cystoscopy is in every way superior to interposing a watery medium and peering through lenses when the view is often obscured by murky fluid, and the examiner is harassed by the technical difficulties of the electrical equipment and by the manifest discomfort of the patients. Air distension is a better method also, as it has a greater range of service in that it permits the examiner to measure accurately distances in the bladder, and with the diameter of the cystoscope as a guide, to determine the actual size of the tumor, which is imperative in determining the type of therapy to institute. Such a careful examination as is possible through an open air cystoscope makes for a more thorough scientific handling of the case and greatly enhances the interest of the work. The chief difficulty with this method of cystoscopy is inexperience with the use of the head mirror and a reflected light, which after a little practice is soon overcome.

All patients with hematuria should be cystoscoped with this condition in mind. Neglect to do this has allowed many small and easily treatable papillomas to develop

into hopeless malignancy, and a comparatively simple condition to reach a most serious proportion, with the case desperate and the treatment extremely difficult and unfortunately less effective.

All bladder growths are potentially malignant. There is a definite class of pedunculated tumors, often multiple, with no underlying induration of the mucous membrane, which respond well to fulguration. This type of treatment was first presented through the pioneer work of Edwin Beer, in 1910. However, it is often impossible to distinguish between a papilloma which will respond to fulguration and one that will not, either by visual inspection or histologically. All other types of bladder tumors seem to be made definitely worse by fulguration.

It is of the utmost importance to get the case under examination and treatment at the earliest possible moment. This can only be done by investigating at once and tracing to its source the slightest urinary hemorrhage. When under treatment the case must be watched over a period of several months or longer, as conditions warrant.

From a review of the literature on this subject, the general consensus of opinion as to the treatment of the condition is as follows:

(1) For all superficial or pedunculated benign papillomata, direct intra-vesical fulguration or removal by means of the cautery gave by far the best results.

(2) For infiltrating, definitely malignant tumors, the radical removal of the area of the bladder wall involved was the only treatment which was followed by any satisfactory results.

(3) When the growth involves both ureters, Watson's operation of total cystectomy, with a primary operation for transplanting the ureters into the loins, gave the best results.

(4) Cystotomy and excision of the growth and treatment of the base with the actual cautery should be used only in hopeless cases as a palliative to relieve pain and hemorrhage.

In 1910, we first began the treatment of bladder tumors with radium. Since that time it has rapidly come into general use and occupies a most prominent position in the armamentarium of many large clinics. Our experience has proven that the best results are to be expected from one, two or perhaps three intensive treatments at an average interval of six weeks. To do this it is of course necessary to have at one's disposal a large amount of radium, as the following demonstrates:

From October, 1910, to May, 1922, 142 cases of carcinoma of the bladder have been treated with radium at the Howard A. Kelly Hospital. Of these, 55 were males and 82 females. The average age was 53 years. The youngest was 26 and the oldest 86 years of age. There were 140 white and 2 colored patients. In 51 cases the patients gave no other symptom than blood in the urine, the longest duration being 6 years and the shortest 2 months. In every case hematuria was a prominent symptom, and in every case it made its appearance early. There was a history of a definite chronic cystitis persisting from 2 to 20 years prior to symptoms of cancer in 17 cases. Palliation was obtained for a short time only or no improvement in 89 cases. In 53 cases there was definite improvement and relief of symptoms for a long time, or cures over a period of three years with no recurrence, as tabulated below:

(1) Cures over a period of three years or longer, 16.

(2) Remained well over a period of three years but died from some extraneous disease, 5.

(3) Clinical cures from two to twenty-eight months and still under observation, 8.

(4) Palliation from two to thirty-four months, with later recurrence or death, 24.

This gives a total of 14 per cent three-year cures with radium in an unselected class of cases. In fact, many of the cases were referred to us with recurrences following operation and a vast number of them were already in advanced stages of the disease.

Fortunately, vesical tumors give symptoms early and many cases come in at a stage when the cystoscope offers both a simple and as effective a route for radium therapy as does a suprapubic opening.

We have employed three different types of radium treatment, used either alone or in combination: (1) direct, intravesical, or

surface radiation; (2) implantation, or the insertion of tiny glass capillary points containing radium emanation into the growth; and (3) massive radiation at a distance from the exterior, using the sacral, perineal, suprapubic and vaginal portals.

In the fall of 1921, we first began the use of the open air cystoscope for the direct treatment of carcinoma of the male bladder, and had employed this same form of treatment in our female cases since 1915. Intravesical treatment is carried out in all growths confined to and around the neck of the bladder: papillomata, papillary carcinomata and infiltrating carcinomata of not over 4 c. c.

Growths other than these without evident metastasis, extensive infiltration of the bladder wall, large and multiple tumors and all doubtful cases, are submitted to a suprapubic section. The intravesical treatment is made through the Kelly or Greenberg open air cystoscope, with the radium encased in a brass capsule attached to the end of a straight sound and held against the tumor under direct vision. For each square centimeter of disease 100 milligram-hours radiation is the maximum dosage. Using an applicator containing 1200 millicuries, it would be necessary to hold the applicator but 5 minutes on each square centimeter to obtain the equivalent amount of radiation. In this way a tumor with a surface 3 cm. square would be given the maximum radiation through the cystoscope in a total of 15 minutes. By using a stronger applicator the actual time of exposure can, of course, be reduced. The entire treatment can be finished at one or two exposures. This amount of surface radiation should not be repeated under a period of six weeks.

With this type of radiation we are first able to determine the reaction to radium that the tumor will show, check the bleeding and treat effectively tumors which involve the vesical neck and internal urethral orifice. If the tumor is a definite infiltrating sessile carcinoma, we may then treat by the implantation technic, introducing small glass emanation points directly into the growth. We have determined that 0.5 millicuries of radium emanation is necessary to destroy 1 c. c. of tumor. These emanation points are implanted under direct vision through the open air cystoscope by means of an especially devised introducing instrument. In this way by having a number of these points ready, each threaded into an instrument, we can quickly and accurately introduce from 10 to 15 throughout the growth, the entire time consumed being from two to three minutes. The points, themselves, are left permanently to decay, giving off their maximum activity by the end of seven days but being slightly active for twenty-eight days. The action from this method is local and caustic. An intensive treatment such as this method affords should not be repeated under two and a half months. By inserting the points directly through the anterior vaginal wall, we are able with a fair degree of accuracy to implant tumors occupying the anterior bladder wall under guidance of palpation.

The suprapubic or incisional type of treatment is carried out in cases where there is no evident metastasis, in extensive infiltration of the bladder wall, large and multiple tumors, and in all cases where there is some existing doubt as to the exact amount of bladder involvement. The bladder wall is palpated before incising to avoid cutting through any growth. Then incision is made and the cut surface of the bladder is caught with Allis clamps. A self-retaining retractor is then introduced into the bladder cavity with open loops. This gives the advantage of making visible a portion of the bladder wall through the open blades of the retractor. An additional retractor in the form of a spatula is occasionally used behind the symphysis, but often is not necessary. Moist alcohol sponges are used to free the bladder of bloody urine, care being taken to prevent bleeding of the tumor and a possible spreading of tumor cells. If the tumor is large and definitely protruding, it is removed with the cautery and the base is cauterized to check bleeding. This permits of better exposure to the base and allows more effective treatment with radium. All of the areas of the tumor are then implanted, averaging a total dose of 0.5 millicuries to each cubic centimeter of growth, particular care being taken thoroughly to implant the margins. Supra-

pubic intravesical surface radiation is accomplished by means of multiple radium capsules, screened with 1 mm. brass and 1 mm. rubber, placed side by side over the surface and overlapping by 1 cm. the margin of the tumor, the number of capsules used depending upon the size of the growth. This applicator is held in place with the patient still on the operating table under anesthesia. For an area of approximately 3 square cm., 900 milligram-hours radiation is given. By using an applicator of 2000 milligrams strength, the treatment is completed in less than half an hour and the actual time can be further cut down by using a stronger applicator. This additional length of time does not add further risk to the operation. The closure is as usual, but for the comfort of the patient it is better to leave a drainage tube in the bladder for a minimum period of ten days. Bladder irrigations through the urethra should be started after the fifth day and the healing of the sinus is not prolonged over that of any suprapubic cystotomy.

We feel in all cases of bladder carcinoma that massive radiation from a distance is helpful. The suprapubic route is usually chosen as giving the closest approach, but the perineal and sacral routes may also be used, and in the case of females, the vaginal route. By using the external portals we frequently reach a total dosage of 30 to 40 gram-hours radiation.

DISCUSSION

Dr. J. T. Geraghty, Baltimore, Md.—Before one can successfully treat bladder tumors it is necessary to determine the nature and the position of the tumor. It has been our experience that the benign and malignant papillomata practically all respond to fulguration and that fulguration gives results that are incomparably superior to anything that surgery can afford for this type of tumor. One will find a certain group of malignant papillomata very resistant and slow in responding to fulguration. If these tumors, however, are given a small amount of radiation their response to fulguration is prompt. The malignant papillomata pass over into non-infiltrating superficial papillomatous carcinomata, which may occupy large areas of the bladder, or may be fairly well localized. Our best results in this type of case have been by the application of radium to the surface of the tumor through the urethra, and those tumors suitable for this form of treatment comprise about 15 per cent of all the tumors.

When the papillary carcinoma reaches the stage where it is infiltrating the bladder wall, surface applications of radium have, in our hands, been of very little value. We feel that when the infiltrating growth is sufficiently localized to permit of excision a radical resection should be done and the tumor removed with a wide margin of healthy tissue. However, where the tumors are multiple or when they are too extensive for resection, the implantation of radium will in a not inconsiderable number of cases give excellent results. Many of the tumors, while being broad based, are much larger on the surface than at the base. It is our custom to destroy the surface of the tumor with the cautery and then infiltrate the base with radium. In a series of fifteen cases we used the emanations, but recently we have tried small needles of the radium element. We do not feel that the amount of radium employed in any case should exceed 2500 mg. hours, as the injury to the bladder is too great. The insertion of emanations or radium needles through the cystoscope into the tumors is only suitable for a very limited number of cases. Recently in several rather hopeless and extensive infiltrating tumors of the bladder we have employed deep x-ray therapy. In one case the tumor, which was considered inoperable and too extensive for radium, disappeared entirely under the deep x-ray therapy. Our experience with this latter form of treatment, however, is too recent and limited to draw any conclusions.

Dr. William F. Braasch, Rochester, Minn.—Certain principles are generally recognized in the controversy with regard to the choice between surgery and radium in the treatment of tumors of the bladder. If the tumors are not extensive and can be removed completely, a wide resection is the indicated procedure. If they are small or situated so that radium can be applied through the cystoscope, such treatment should be given. We have largely abandoned resection of extensive tumors of the bladder necessitating reimplantation of the ureter, since the procedure has not always been successful and is accompanied by a high mortality. Suprapubic cystostomy and the implantation of radium emanations, according to the method of Dr. Barringer, has been substituted for surgical procedures. I consider this the greatest recent advance in the treatment of tumors of the bladder.

The percentage of recurrences in small papillomatous tumors removed by fulguration or radium is not so large among those that we have observed as Dr. Geraghty's data would indicate. It has been our experience that not more than 25 per cent of the patients observed with tumors of the bladder can be treated successfully by fulguration or a combination of fulguration and radium. In the remainder the tumors are of the solid type or are malignant papillomas which require resection or the introduction of intensive radium emanation.

I wish to bring up another point, that is the great value of the early diagnosis of tumors of the bladder. Although this has been emphasized repeatedly, it is surprising how many patients present themselves with all of the identifying symptoms who have been treated by physicians for

many months. It is evident that if the tumor is discovered in its early stage the possibility of cure is much greater by any of the therapeutic measures employed. Even malignant papillomas, when observed in the earliest stages, may be amenable to such simple cystoscopic procedures as fulguration and radium implantation. Every means should, therefore, be used to discover at once the cause of hematuria and urinary frequency, and the patient should be referred to a urologist for careful examination.

Dr. Edgar G. Ballenger, Atlanta, Ga.—We are all familiar with the difficulties of permanent drainage of the bladder in inoperable or recurrent carcinoma of the bladder and prostate gland. If the drainage tube is small, it is likely to become plugged with blood clots, while on the other hand if it is large it is unwieldy and produces more or less discomfort. During the past few years we have modified the method of dealing with these patients and the results have been quite satisfactory. Suture of the bladder to the abdominal wall is not necessary, but facilitates subsequently the introduction of the tube. The incision is closed in the usual manner and a one-half-inch tube is cut off so as to project about one-quarter inch above the skin. A very large safety pin is then passed through the outer part of the tube. A strip of sterile adhesive plaster with a hole in it is carried over the end of the tube and safety pin in such a manner as to hold the tube in place. Sterile vaseline or zinc ointment is smeared around the area of the incision. Then a large colostomy ring with a rubber sleeve over it is placed so that the ring does not press on the incision. The strap is adjusted around the back and tightened until comfortable. The urine is carried through a tube into a bottle by the bedside. Moving this tube or traction on it does not cause any discomfort because it is attached to the belt rather than to the tube in the bladder. All of the tubes are large and allow the passage of clots.

The device may be removed from time to time as indicated (two to seven days) and the tube in the bladder is then cleaned and boiled. Dakin's solution, argyrol or other medicaments may be injected as indicated through the outer tube or through a catheter passed into the bladder. If desired, radium may be applied through the incision, as the opening is kept rather large. Surprisingly little trouble is experienced in the management of malignant growths of the bladder or prostate by the plan above outlined. In fact, a nurse or orderly or a member of the patient's family can make the changes when necessary. It is not suitable for patients who are very thin or whose symphysis projects so as to prevent a smooth seating for the ring or a large colostomy device. The patient is kept dry when he is on his back, propped up in bed, in a wheel chair or walking around, but it is likely to leak when he is on his side.

Dr. H. W. E. Walther, New Orleans, La.—Dr. Neill's paper has emphasized the large doses of radium necessary in treating neoplasms of the bladder. Most surgeons work under the handicap of not having sufficient radium to benefit these cases. One gram is not enough. That dose does not control them, and until we get more radium in the South to handle these cases I do not see how we can hold out much hope to our patients or to our consultants and make much impression upon them.

Another point of great importance re-emphasized by Dr. Neill is the elasticity of radium emanation as compared to element. We need more radium emanation stations in the South. With these we could reach many more cases and do infinitely more good. In our work in New Orleans particularly we are constantly in need of emanation, and I feel that it is going to be forced upon those handling and owning radium to install an emanation apparatus in order to give our patients and us satisfaction in the therapy of this condition.

Dr. Neill (closing).—Referring to Dr. Geraghty's remarks in regard to radium and operation, I am not in favor of pre-operative radiation unless the operation is carried out not later than three or four days afterward. A further delay means that we will find marked irritation of the tissues, which are always friable and difficult to deal with, and the chances of a healing of the wound are not so good. In papillary carcinomata, the histological picture helps us little in a prognostic way. We have often found that of two tumors which give identical microscopic pictures the response to radium in one will be satisfactory, while in the other there will be no beneficial effect. In the far advanced and hopeless cases, heavy massive radiation from a distance to include the entire pelvis is often palliative.

EYE, EAR, NOSE AND THROAT

THE PROBLEM OF OBSCURE NOSE AND THROAT AFFECTIONS*

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One of the most perplexing problems confronting the average laryngologist is the accurate diagnosis and proper treatment of borderline or indefinite affections of the upper respiratory tract. Cases where the local pathological changes are insignificant in comparison to the systemic reactions produced.

Foci of infection frequently cannot be identified accurately by objective means, but present positive general symptoms of absorption in associated structures. It is these obscure affections which give us most concern and require extended study for accurate interpretation.

For the purpose of this discussion two general groups will be selected, attention being given to the unreliability of clinical changes and objective methods of examination, compared with the value of subjective and general symptoms in a final determination of the case.

The first group comprises indefinite infections of the accessory sinuses presenting minute or uncertain pathological changes in the intranasal structures, in contrast to the severity of systemic reactions manifested.

It is important to recognize these cases early, before toxic absorption has produced permanent tissue degeneration.

We have little difficulty in handling the usual run of sinus cases with destructive local changes and symptoms, but the borderline cases present a different proposition, for in these we must depend upon the reaction in remote structures for our positive information.

In making a diagnosis of any case, our conclusions are based upon the local pathology, objective impressions and systemic symptoms.

Roentgenography gives us valuable assistance in many of the usual sinus cases, but in this group the tissue changes are so slight that we may be misled by a negative report. Transillumination at best is unsatisfactory and cannot be depended upon for accurate diagnostic purposes. Tenderness over the sinuses is not a constant symptom and is generally absent in the low grade infections.

Bacteriological smears and cultures do not give us the desired information, because the upper respiratory tract is the natural habitation of many organisms, and it is difficult to say when an area is truly infected by this procedure.

We place most dependence upon examination of the intranasal structures for abnormal changes. But unfortunately in many of these cases it is impossible to determine the presence or absence of infection by the local appearance of the tissue. The nasal mucosa may seem to be normal, breathing space unobstructed, turbinates of regular size, with little change in nasal secretion, while the patient gives definite general symptoms of toxic absorption.

So if we must admit that the local changes are insufficient to establish a positive diagnosis and that the average methods of objective examination are unreliable in these cases, it is obvious that our final determination must be governed by a thorough study and understanding of the general subjective symptoms presented and the changes produced in associated structures.

As specialists, we are so accustomed to dealing with the local changes in our particular field that we frequently attach too much importance to the presence or absence of local pathology without due consideration to the many complicated reflex phenomena which frequently present the most reliable sources of information.

For this reason, it is essential to lay great stress upon thorough history taking. We should not be satisfied with the knowl-

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edge of intimate complaints involving the nose, throat and ear alone, but all remote symptoms indirectly produced in other structures must be given due consideration. With the average run of simple cases, it is very easy to form the habit of superficial history taking.

Complete physical examination will at times reveal the relationship of some obscure focal infection to an unsuspected organ. Closer cooperation with the internist is desired. The internist depends upon us in building up his diagnosis in obscure cases, but do we demand the same of him in our complicated nose and throat affections? No organ should be neglected in our survey. The eyes require special attention, for they are very sensitive to toxic reactions and frequently present the earliest symptoms of involvement. Such disturbances as photophobia, asthenopia, muscular weakness, defective vision, iritis, choroiditis, retinitis or neuritis may be our first warning of an insidious nasal infection without demonstrable changes in this structure.

A case in point was Mr. A, referred to me by an excellent oculist for nasal examination to determine the cause of persistent asthenopic symptoms which could not be relieved by refraction. This patient was unable to use his eyes for any great length of time. His eyes would burn, itch and tire quickly after reading, with headache and pains across the bridge of the nose.

After a very careful nasal examination I could not find sufficient evidence to say definitely that his trouble was coming from an infection in the nasal area. But considering the symptom complex, nasal treatment was instituted with gratifying results, for all symptoms quickly cleared up.

A second case of similar type was referred for the relief of a single symptom, intense photophobia, which could not be relieved by ophthalmological means. As before, my nasal examination was practically negative so far as clinical changes were concerned, but, profiting by previous experiences, intranasal treatment was given and in a short time the patient was well.

These cases were evidently low grade infections of the ethmoidal region and could have been easily overlooked if attention had been directed merely to the nasal region without consideration of the associated eye symptoms.

The general health of the patient should be investigated for remote indications of septic absorption. Malaise, sallow skin, loss of weight, nervousness, insomnia, gastro-intestinal disturbances, arthritic involvement, vascular changes, nephritic complications, infections of the respiratory tract, in short a complete physical survey, may result in the development of some symptom or group of symptoms which will guide us in the determination of these borderline affections.

At times general symptoms are so distinctive that attention may be entirely diverted from the primary focus of infection.

A striking case of this nature coming under my observation was a dentist who had been incapacitated for a year. He had the most severe group of general toxic symptoms I have ever seen. His skin was sallow and he was losing weight and unable to work. He had marked insomnia, was nervous and irritable with severe disturbances in his gastrointestinal tract. He had been treated for everything from neurasthenia to tuberculosis. At one time he had been referred to a rhinologist, who could find no cause for his infection, so he continued to take tonics and absorb toxins.

After taking his history I gave special attention to the nasal examination.

The local picture was not conclusive of an active infection, but there was a slight amount of this serous discharge from the right ethmoidal region and an x-ray report of slight haziness of the ethmoids on the right side.

Being influenced more by the general symptoms than by the intranasal findings, I determined to clean out thoroughly the right ethmoidal labyrinth, after which the patient began to improve steadily and was soon entirely well.

This patient has worked hard and constantly for the past two years without recurrence of any of his old symptoms.

The diagnosis of this case was missed by the first rhinologist because the local changes and symptoms were not sufficiently defined to produce a classical picture of sinus involvement.

It is very probable that I would have made the same mistake if I had not been impressed with the severity of the general symptoms and made special effort to discover the cause.

Headaches and pains are so constantly associated with sinus involvement that they are generally recognized and appreciated as important subjective signs, so that mere mention of them is necessary here. Likewise vertigo, nausea and vomiting are often indications of disturbance in this region.

There are many obscure reflex nasal phenomena which are as yet not well understood, and which present an interesting field for development in relation to these

indefinite affections. So that a thorough and scientific study of the many complicated and associated bodily reactions will not only prove helpful in solving the problems of the individual cases, but will add to and broaden the knowledge in our specialty.

The second group of cases will be very briefly considered, for they have general features in common with those mentioned.

This class includes chronic infections of the tonsillar tissue with little demonstrable evidence of local involvement. The tonsils are often small and submerged, with few crypts. There may be no enlargement or tenderness of the cervical glands, yet general symptoms clearly indicate that absorption is going on in this vicinity.

In these cases it is easy to form erroneous conclusions if we are readily influenced by the local picture and do not make a careful investigation of every possible general symptom before a final opinion is rendered.

Only recently a case was referred to me with a request that the tonsils be removed as a most likely cause of acute nephritis. From their appearance, no one would have said that the tonsils were abnormal, but after their removal all symptoms of nephritis cleared up.

Another case, a medical student, developed a severe hemorrhagic retinitis. A most thorough examination was made to determine the cause. All tests were negative. In his history he admitted having occasional attacks of sore throat, but the appearance of his tonsils did not indicate infection. As a last resort his tonsils were removed and in a few weeks the hemorrhages had cleared up, vision had returned to normal and he has had no recurrence of his eye symptoms since operation over three years ago.

Other cases with similar characteristics could be mentioned, but the type is familiar to all of you.

The cases presented are merely to emphasize the fact that it is important to recognize focal infections in the upper respiratory tract at the earliest possible time, before toxic absorption has produced permanent degenerative changes.

As many of these cases are difficult to determine on account of indefinite local pathology, we must be governed in our final opinion by a careful study of the general symptoms and the reaction in remote structures.

For this reason a very careful history is necessary. Complete physical examinations are important. Investigation of eye symptoms and changes in other organs may lead to the development of factors which prove to be the deciding element in a final analysis of the case.

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DISCUSSION

Dr. W. E. Driver, Norfolk, Va.—These conditions of the nose such as polyps and diseased ethmoid may manifest themselves remotely and in a general way, such as asthma. We have been able to demonstrate in a case of asthma, thought to be of an anaphylactic condition in the class cited by Dr. Townsend in his paper, definite changes spoken of by Widal as the hemoclasic crisis, that is a fall of blood pressure, an increased coagulability of the blood, a decrease of the white corpuscles, and a lessening of the index refraction of the serum. As this crisis passes, the asthma manifests itself. So we cannot study these cases from the general standpoint too closely. It seems important to have a dentist, an internist, and a serologist at one's disposal, but, as this is not often practical, it becomes necessary to study these cases ourselves in order to know how to treat them.

Dr. R. G. Reaves, Knoxville, Tenn.—The Doctor's paper is entertaining and timely, but the trouble is he has still left us with the problem. The truth is that we are all up against it in the borderline cases. We have patients whom we feel are absorbing toxin from somewhere, but from where does it come? Perhaps it is the tonsils. We feel pretty strongly it is the tonsils. The tonsils are not enlarged and there is little congestion; but we do know that sometimes we take such tonsils out and secure wonderfully beneficial results, while at other times we do not. If the tonsils are enlarged, we feel they ought to come out. A patient may come in with an antrum filled with pus. That is easy to diagnose. But it is the borderline cases that give us the trouble.

The most important thing is a careful examination. I have never used an arc light, but I do use a Holmes nasopharyngoscope, and I do not feel I can thoroughly examine a nose without that instrument, because it reveals things the x-ray will not. I can look in other than direct line of vision and I do not feel that I have given a patient a careful examination unless I have used that instrument.

I would like to mention a case, a patient who had been having typical headaches from irritation of Meckel's ganglion. The teeth had been extracted and the tonsils had been removed. She had a post-nasal discharge and headache, occipital and parietal, and pain about the left ear. With the Holmes nasopharyngoscope I could see definitely an edema of the mucous membrane up in the posterior ethmoidal region, and from that I took my cue and advised the patient what to have done. But I treated her and gave her some relief for about six or eight months. Finally

she decided to have an operation. I had an x-ray made, which showed some hyperplastic conditions of the left ethmoid. I did a complete sinus operation, which I believe is the safest in these cases, and the patient got relief almost immediately. I did the operation about three months ago. She has gained fifteen pounds and is another woman. I found no pus, but there was an edematous condition of the mucous membrane.

Another case, one of arthritis, was sent to me to search for focal infection. She had a postnasal discharge, no headache, but she had a history of antrum trouble on the left side. The x-ray showed more trouble on the right side than on the left, but putting the history and all together I operated upon the left side. I found no pus, but I found congestion and hyperplasia of the bone. That was about a year ago. I saw her the other day and found the operative field clear. There is no discharge, and the arthritis has disappeared. In these cases I was successful in making a proper diagnosis, but I still have borderline cases where I have a problem of diagnosis that is difficult to solve.

Dr. Homer Dupuy, New Orleans, La.—I enjoy the privilege of teaching post-graduate students. The question is often put to me in regard to the suspected tonsils. In the presence of a local picture in which there is no enlargement of the tonsils proper, no apparent secretion or debris obtained from the follicles of the tonsil, and yet in which the history is that of polyarthritis or some other end infection. Every field has been investigated with negative results, and the burden of proof finally comes to the throat man. My students want to know, in the face of this apparently negative picture of the tonsils, whether there is any one sign by which we can put the onus on the tonsil. Even though the tonsil be not enlarged, even though the follicles secrete apparently no pus, even though they are the submerged type and appear not off-colored, if a deep red areola surrounds the tonsils, covering the anterior pillars, the posterior pillar, this distinct red areola surrounding the tonsil means pathologic tonsils.

You may be doubting Thomases. But I am giving you the facts as I have seen them, and I wonder if you have been impressed with this deep red areola surrounding the tonsils as showing unquestionably that the tonsils are diseased?

Dr. M. M. Stapler, Macon, Ga.—Probably one other hidden local pathological condition should be mentioned. I refer to aborted wisdom teeth. There may be no disease of these teeth *per se*, but their abnormal position is sometimes the cause of disturbances. Let us not forget them when we are looking for hidden local pathological causes.

In working out these obscure cases I think one should be careful about making positive statements as to the immediate results, for we are now beginning to get a broader conception of focal infection in that we do not expect to clear up all suspected cases by removing diseased teeth and tonsils.

Many people come to us about the time they are reaching the evening of life complaining of symptoms that may direct our attention to the paranasal sinuses as foci infection. In such cases the infection may have been present for years with repeated acute exacerbations, and it is after one of these acute attacks that we stand the best chance of getting the desired information from an x-ray.

The tonsils should be removed in any proven case of chronic sinus infection. In real cases of pyorrhea, the tonsils should be removed before dealing with the teeth.

Dr. Looper (closing).—In many of the low-grade focal infections of the nose and throat our conclusions must be formed principally by the character of general symptoms presented, as the local tissue changes are uncertain. For this reason a thorough physical examination in all borderline cases is necessary.

It is important to determine and eliminate infection as early as possible, before advanced pathological changes have been produced. Often some remote systemic symptom will be our first warning that toxic absorption is taking place. Hence, careful study of every organ should be made in all obscure cases.

DIRECT INTUBATION IN NEGLECTED AND DESPERATE CASES OF TRACHEAL AND BRONCHIAL DIPHTHERIA*

BY CLYDE E. PURCELL, M.D.,
Paducah, Ky.

It is the purpose of this paper to discuss the remarkable advantages of direct intubation and bronchoscopy in dealing with respiratory obstructions due to laryngeal, tracheal and bronchial diphtheritic involvement. It is also our purpose to explain the causes of these advantages and to suggest wherein we may, in these desperate and neglected cases, gain new results and add a new weapon against these inspiratory difficulties. These deductions are based upon two experiences in the removal of membranous obstructions from the bronchi in connection with conclusions based upon experiences in ten direct intubations.

It might be well at this particular time to emphasize that this small series of cases is not sufficient to draw a permanent conclusion; but since there have been so few attempts, so far as the writer knows, at removal of membranous obstructions from the bronchi, it may not be out of

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place to report these two instances. Also, the conclusions arrived at in managing these ten cases of direct intubation are convincing enough in the writer's mind of the superior value of direct intubation and the hope of wonderful achievement by its use if carefully carried out.

During the past two years I have had two experiences with diphtheritic obstructions of the bronchi.

One case I reported in the *Laryngoscope* for September, 1921. An emergency tracheotomy was necessary to get the child into the hospital alive. Later, difficulty in breathing was developed, and the tracheal tube was removed, cleaned and reintroduced with no improvement in breathing. The situation seemed hopeless. I did not then know a membrane could be removed by means of the bronchoscope. As there was no other chance or hope of relieving the child, the family physician agreed with me to pass the bronchoscope in order, if possible, to find out the cause of the labored breathing. Both bronchi were practically closed by membranes which were a dirty gray color. I lost no time in removing them with forceps through the bronchoscope. Immediately there was relief from difficult breathing and the child soon fell asleep with apparently unimpaired respiration. Unfortunately, these obstructions reformed and we were compelled to remove them repeatedly, probably ten or a dozen times. This is the only instance in which I have worked through a tracheal wound. It is no easier than through the mouth. This is in accord with the conclusions of one of the best bronchoscopists in America or Europe. Large doses of diphtheritic antitoxin were given until 150,000 units were administered. After the membranes in the bronchi stopped forming, the child made a quick recovery. Originally, no doubt, this was a case of laryngeal diphtheritic stenosis, bronchial diphtheria developing later. It is interesting to relate that at no time were there symptoms of shock or exhaustion. The child has remained well since its recovery, nearly two years ago.

In the second case, a child twenty months old, an intubation tube had been placed by the direct method with no anesthesia and no bleeding, which was a positive proof of no trauma. There was immediate relief from suffocation. All went well until the second day, when the nurse telephoned that the child was beginning to fight for air. At once I suspected extension of the stenosis into the bronchi and made preparation to pass the bronchoscope. When I reached the hospital the nurse informed me that the child was worse and that in her absence from the room for a moment the child had, in its struggles and efforts to get air, grasped the silk cord which was fastened to the cheek and had withdrawn the tube. However, this did not make matters better or worse. The mother, who was present, was asked to watch the child when the nurse had to leave the room and prevent its grabbing the cord and doing exactly what we wanted it not to do. As I was prepared to do a bronchoscopy, I passed the tube at once to the bifurcation and found an obstructing membrane in the right bronchus, which was immediately removed with forceps through the bronchoscope. This established perfectly free breathing. The intubation tube was again introduced and the child made a prompt recovery. It goes without saying, of course, that antitoxin was given in large doses.

For a long time I have felt that the palpation, or so-called blind method of intubation, could not be accurate and free from dangers. This has precipitated many debates in medical societies on the relative merits of intubation and tracheotomy. I do not desire to revive this discussion. However, my own conviction was that intubation by palpation or the O'Dwyer method was, on account of the unavoidable trauma to the larynx and the consequent complications arising from these injuries, less desirable than tracheotomy. Therefore, it was my custom, at that time to advise tracheotomy. With the advent of direct laryngoscopy, it became apparent that intubation tubes could be introduced with great accuracy and without trauma. In 1910, while in bed from an operation, I mentioned to a physician an instrument I had in mind for directly placing the intubation tube. However, I never attempted to carry this idea out. I did, though, on several occasions place intubation tubes in position by means of the Jackson direct laryngoscope and alligator forceps. This method had the difficulty of the tongue's being in the way, since the slide had to be taken off the laryngoscope and then, too, one did not have the tilting action necessary to raise the tube after it had passed over the tongue into the larynx. This difficulty was overcome by catching the tube so as to place it at an angle of 35 degrees above the shaft of the alligator forceps.

When Mosher brought out his instruments for direct intubation he solved all these difficulties. Alligator forceps through a direct laryngoscope may be used very readily to remove the tube. Tube and forceps may be withdrawn together after the tube has been grasped with forceps. The writer used this method on one occasion before Mosher brought out his instruments to extubate in a patient where my predecessor had failed to remove a tube which had been very accurately placed by

the blind method. It was gratifying to have the patient's parents comment at this time upon the absence of bleeding, which, they said, was profuse at time of intubation and also at the time of attempted extubation.

In no case was it necessary to leave the tube in for more than a week. There were no chronic tube cases as we used to have by the palpation method. Absence of trauma at time of intubation must have been a factor in preventing laryngeal constriction. Direct intubation has the disadvantage that it cannot be performed except by those skilled in bronchoscopy. In order to show the necessity of hospital care and attention, it is thought advisable to report two cases. The first, which is an average case, is as follows:

A child, four years old, developed laryngeal diphtheritic stenosis and was seen by the family physician early in the morning after the stenosis had become evident to the parents. The physician at once administered 20,000 units of antitoxin which did not immediately relieve the stenosis. The patient was sent to the Isolation Hospital and the writer was asked to place an intubation tube, which relieved the stenosis immediately. Diphtheritic sloughing was present everywhere in the throat of this child. Large doses of antitoxin were at once started and 175,000 units in all were given. In five days the child was apparently normal. We were unable to get the parents to keep this child in the hospital longer; they felt they could care for it at home just as well. At that time it was breathing freely; pulse, temperature and respirations were normal, and it was fretting for something to eat. When the child left the hospital the parents were cautioned to feed it only liquid nourishment. Two days later the patient was so insistent for something to eat that the mother gave it a biscuit and a piece of meat. A little later the writer was hurriedly called to see the youngster, and on his arrival at the house the patient was dead. No doubt the piece of meat lodged in the intubation tube. As this child was perfectly normal in every way when it left the hospital, there can be no blame attached to the method of intubation.

The last case was that of a child two years old, who was seen by the family physician and a diagnosis of laryngeal diphtheria made. The patient was sent in to the Isolation Hospital and the writer was asked to do an intubation. The diphtheritic involvement was all in the larynx and a tube was placed by the direct method. In a few seconds the child greatly improved. Antitoxin was given in large doses. Nursing was carefully carried out. The tube was removed at the end of seven days and the child left for home twelve hours later. It has remained perfectly well since.

These desperate and neglected cases are the ones usually that have no physician. People wait until the child is almost dead before they call the family physician and laryngeal stenosis has already made its appearance and has caused the parents to seek professional aid from the family physician. Fortunately, as time goes on, there are fewer occasions for intubation. With the widespread knowledge of the value of antitoxin administered early, in the future there will be few occasions to observe the complications of diphtheritic involvement. In the cases that have come to the writer's attention, no blame could be laid at the door of the family physician for not having administered the antitoxin early. In most cases the writer has seen these cases about as early as the family physician.

My present conviction is that with the two weapons at hand, namely, direct intubation and bronchoscopy, we can practically eliminate tracheotomy in the management of diphtheritic stenoses. Everyone who has had experience with tracheotomized patients knows that it requires very skilled nursing to take care of them. However, intubation cases with ordinary nursing are not such a problem. It must not be understood from what I have tried to say that this is a panacea for diphtheritic stenotic complications. I do feel, however, that if a patient has no lung complications, no kidney involvement, and is not profoundly septic from absorption of toxins, that the two means we have at hand, together with massive doses of antitoxin, ought to save a great majority of them. In fact, I have been able, so far, to save every one of my own. In other words, it strikes me that we ought to be able to handle successfully all cases of diphtheritic stenoses whatever their character, whether they be laryngeal, tracheal or bronchial, or all combined.

DISCUSSION

Dr. A. E. Goodloe, Chattanooga, Tenn.—No matter how proficient and expert one may be in doing the blind method, there are certain things that one cannot know about the condition of the larynx which can easily be seen and ascertained by the direct. One is that it cannot be known when a tube is inserted with difficulty whether this difficulty is caused by edema or by a spasmodic condition, and it is the tendency to use

more force when the tube is to be inserted in the larynx than there would be were one looking into it. The advantages are analogous to the gynecologist when he makes a digital examination of the cervix uteri and then inserts a vaginal speculum and looks at it.

There are cases where diphtheria has been superimposed upon a previous inflammation of the larynx due to a foreign body, such as a nut hull, a pin, or other object. Here we would probably get both the clinical manifestations and the laboratory diagnosis of diphtheria and would feel perfectly safe in giving the regular treatment, little suspecting anything else until the patient's failure to recover points to some complication. This condition would most likely be seen at a glance upon the insertion of the laryngeal speculum and could be removed.

It must be remembered that in some of these cases minutes—and even seconds—make that small margin between life and death, and the operator should choose that method which insures air to the lungs in the quickest time possible, and the one that is most free from accidents and dangers. I believe the direct offers us those qualifications.

It has been argued that there is likely to be more trauma produced by the manipulation of the speculum than there would be by palpation. This sounds very well, but we must remember that the operation is not finished by palpation, but that the end of the tube is being forced against the cords and would be at least as likely to produce traumatism as would the smooth-ended speculum manipulated under the guidance of the eye.

I understood from the Doctor's paper that the child in his second case lost its life from the pulling of the tube out of the larynx by the attached string. I do not know whether or not he leaves the string in all of his cases, but if he does I believe the removal of the string to be better. It annoys the child much and there is always a certain amount of danger of its being pulled out. If the tube is properly fitted I can see no reason in leaving the string in.

So far as I know, Dr. Purcell is the first man to report the removal of bronchial casts from the bronchi in diphtheria through the bronchoscope, and of course this is encouraging. His having to remove them so many times in the same case and the failure to clear them up after the repeated administration of such large doses of antitoxin, is most interesting, and it is unfortunate that he did not have the laboratory findings to back up his diagnosis, if nothing more than to prevent criticism in the future of this most unusual case.

Dr. Homer J. Dupuy, New Orleans, La.—As a matter of historical record, we should not forget that the lamented Dr. Lynah, of New York, ten years ago reported a series of thirty or more cases of tracheo-bronchial diphtheria, in which he diagnosed the disease through a bronchoscope and removed membrane through the bronchoscope. This work is so monumental in character that it must not escape our attention.

I do not believe the direct method is advisable as one of selection. I do not believe that the indirect method in the hands of an experienced and accomplished intubationist is the cause of traumatism. We have chronic tube cases, that is true, but the trauma is produced not so much by the primary insertion of the tube as in some instances by the long contact of the tube with the parts. In other words, it is not so much a question of intubation *ver se*, but a question of how long the tube must remain in the larynx. There is also subglottic laryngitis resulting in hyperplastic changes below the larynx which also account for a chronic tube case. From my experience in the Charity Hospital, where we have ample material for intubation, I believe that as a whole indirect intubation in the hands of an experienced intubator is more quickly done than by the direct method. Marked dsypnea calls for immediate help, and by the time you get your suspension apparatus working, and overcome the mechanical difficulties which lie in your pathway, no matter how accomplished you are in the art of suspension, I think there will be too much waste of precious time.

Dr. Purcell (closing).—I am glad to know that this has been done before. I told Dr. Goodloe that I had written the *Laryngoscope* and the *Journal of the American Medical Association* in order to get all the literature bearing upon the subject, but they said they had none. I am glad to know that Dr. Lynah had already succeeded in doing this. At any rate, it is worth while calling attention again to the fact that we have an efficient means of removing these obstructions from the air passages.

Chronic tube cases have been mentioned and it might be said in that connection that the reason for the chronic tube case is the primary injury to the larynx. That is the old charge against the indirect method—inevitable trauma of the larynx. Suspension has been mentioned in this discussion. We would think it a great drawback in placing the tube by sight in that it would be an unnecessary addition to the equipment.

MEDICAL EDUCATION

THE TEACHING OF PHYSICAL DIAGNOSIS AND ITS POSITION IN THE CURRICULUM*

By I. I. Lemann, M.D.,
New Orleans, La.

The pedagogics of the medical curriculum has properly and logically become of increasing importance. Conferences such as this are devoting more time to the rearrangement of the curriculum, the redistribution of the hours and the consideration of the fundamental principles of teaching, and less attention to the introduction of new subjects, no matter how meritorious, into the already crowded schedule. It is no longer simply a question of how much and how detailed information we may pour into the student mind, for that conception of the function of the medical school can go no further. The *reductio ad absurdum* has been reached. The limit of hours and minutes cannot be indefinitely stretched. Dr. Roy Lyman Wilbur has succinctly stated the problem in his address before the last Annual Conference on Medicine, Education, Licensure, Public Health and Hospitals:

"The development of the power of observation and of rapid honest, unbiased reasoning based on ascertained facts, is the specific problem before the medical student. . . . The fundamentals with which they must concern themselves [students] are: (1) sound basic training in methods of thought, memory and honest reasoning; (2) the ability to observe; (3) the ability to use books and the tools of the profession; (4) the retention of a sound body with acute trained senses; and (5) the mental accumulation of essential facts immediately available for use."

There is no place in the curriculum where the constant application of these principles is more important than in the course in physical diagnosis. It is at once the basis of all future clinical training and experience, and the first point of contact with medicine as an art. Too commonly there is a chasm between the fundamental branches and the clinical subjects, a physical chasm represented by miles of separation between the university campus and the hospital and a mental, an intellectual chasm caused by the pedagogic failure not only to bring into contact and correlation the facts of anatomy, physiology and pathology with the data obtained at the bedside, but also to bring over into the clinic the scientific spirit of independent investigation typified by the laboratory. The teacher of physical diagnosis must give consideration, therefore, to three main things: (1) the method of his course; (2) its correlation with other parts of the curriculum; and (3) its content.

For many years it has seemed to me that the prime difficulty in teaching physical diagnosis lay in the raw material before us, i. e., the student mind, or rather in the inadequate and improper preparation of that raw material. We have had to spend an undue portion of our limited time in cultivating a spirit of independent investigation and scientific curiosity. There has been always on the part of the student a too great readiness to be shown and too great willingness to accept without question the intellectual pabulum offered. The prime difficulty is due most of all to the faulty training in primary and secondary schools. The inertia there acquired is not overcome by the routine of college laboratory and the perfunctory performance of set experiments. Nor do the college and professional schools attempt adequately to overcome the difficulty set before them. Not sufficient emphasis is laid upon the training of the mind and upon the correlation of acquired facts, and too much upon the acquisition of those facts. This attitude of mind should have been so thoroughly prepared and cultivated that it has become instinctive by the time the student has reached his course in physical diagnosis. The teacher of physical diagnosis has the responsibility of its further development and two further responsibilities, namely, that of training the eye, finger and ear in new methods, and that of introducing the student to the art of medicine.

For at the very onset the embryo doctor must be impressed with the fact that there is an art as well as a science of medicine

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although ideally the two blend thoroughly one into the other. The student is no longer to deal with inanimate or inarticulate things nor animals of a lower order. He is to consider his approach and his relation to a fellow human, to appreciate that the ultimate reason for the calm, dispassionate investigation of the physical make-up and functioning of his subject is the relief of his suffering. His "subject" is now a "patient," that is literally "one suffering." In such a spirit of research, then, and of proper personal bedside conduct, must the course in physical diagnosis be conceived and carried out.

Many of the methods of the laboratory may be adapted and many analogies developed. First there must be a demonstration of the methods to be employed and a discussion of the fundamental principles of physics which permit the evaluation of the data obtained by these methods. Then come, in logical sequence, the establishment of standards of normal and the labeling of the abnormal. Each patient is to be regarded as a new problem to be solved as one solves an unknown solution in the chemical laboratory, applying the various tests of inspection, palpation, percussion and auscultation as one applies the various tests at the chemical bench. There is constant need for correlating clinical phenomena not only with physical but also with anatomical, physiological and pathological data.

In our school it has been the custom to give in the third trimester of the second year a preliminary course in physical diagnosis, indicating the methods to be used and establishing the normal. For this the students practice upon one another. There is no discussion of abnormalities. Physical diagnosis proper is taught in the third year in small sections of about fifteen students, each section being taught by at least two, and usually three, instructors. This averages, then, about five students per instructor. Because of our abundant indoor service which provides amply for our senior students and leaves an abundance for the juniors we have preferred to give the physical diagnosis in the wards rather than in the out-patient department as is usual in most schools. This indoor service permits a better adaptation of the laboratory method. Two students are assigned to a patient and the instructors move from bed to bed, assisting, quizzing, elucidating and stimulating. When a group of two students have completed their examination of a patient they turn to an instructor to have their findings checked up and to undergo a quiz upon the interpretation of their findings. A record is kept of the grade obtained and also of the type of case. Each student's card at the end of the course shows the number and type of cases he has seen and we try to distribute the cases so that each student's experience is sufficiently varied.

We think the ward preferable to the out-clinic not only because of the ease of adaptation of laboratory methods, but also because of the possibility of continuing the examination beyond one period. It has, however, the disadvantage that the students do not work as rapidly as they would be forced to in the clinic. Incidental and corrollary to the routine outlined the instructors assemble multiple groups, say four or six students, for brief demonstrations and labeling of abnormal conditions. We say, for example: "Come here and listen to these crepitant rales." "Feel this thrill." "Here is a capillary pulse to be seen." Likewise we send successive pairs of students from their own patient to be shown another patient by other students whose patients have typical abnormalities.

It is not always easy to make sure that the student is observing the same thing as the instructor. Just as in the laboratories of anatomy and pathology the student is required to make a drawing or diagram of what he sees, not only to make a record but also to insure his understanding, so in the clinic this might be used to a limited extent. It is particularly difficult to know that each and every student is hearing the same sounds we are hearing and this difficulty is not always or entirely obviated by the multiple stethoscope. A description of the sound by the student is helpful, as is also a comparison of it to some other well-known sound (rubbing of hair, gallop, whistle, snore). But most helpful, it seems to me, is the requirement that the student imitate or reproduce it by sounds made with mouth or hands, etc. Such a reproduction of the thing heard is analogous to

the reproduction by drawing of the thing seen. However, students are not easily persuaded to try it.

In addition to establishing "normals" and labeling abnormals, schemata are indicated for the analysis of phenomena. For example, respiratory types are analyzed as to pitch, intensity, quality and relative duration of inspiration and expiration. Heart murmurs are analyzed as to the time of their occurrence and the area of their maximum intensity.

The problem of correlating the course with physics, anatomy, physiology and pathology we attempt to cover in an amphitheater demonstration once a week, to which the whole junior class comes. A patient is shown and a student is called down to demonstrate and report to the class what he may observe. Preference is given to cases which present phenomena apparent to all on the benches, but this is not exclusively the case. A running quiz of the student in the pit and also of the entire class is developed. In these assemblies a general discussion is provoked of such topics as the explanation of the production of rales, of varying degrees of resonance and fremitus under different pathological conditions, of the cause of orthopnea, dyspnea, edema; arrythmias, their classification and methods of their identification by bedside methods without instruments of precision, etc.

Reference has been made already to the position of the physical diagnosis course in the curriculum. In the days before the concentration of the pre-clinical subjects, I was introduced at once to the study of physical diagnosis coincidently with that of anatomy and physiology. My colleagues and I knew hardly more than the existence of heart, lungs and liver and our notions of their location were quite dim. Much vaguer still were our ideas as to diseased conditions that might occur in these organs. It is true that we gained something in point of time and something, too, in the immediate interest in all things medical which is lost to some extent in the detached attitude incident to the isolation of the fundamental branches. We did not, however, have the fundamental knowledge necessary to correct judgment of the things we were shown. Some have begun to agitate for the return of the former method and to insist upon the desirability of the student's association with things medical from the earliest point in his course. I have seen both methods tried and with all its weaknesses I prefer the present to the former one. An adaptation can possibly be made, but it seems to me that that adaptation cannot possibly precede some knowledge of anatomy and physiology; in other words, that the student's contact with things medical cannot be profitable before the latter part of the second year.

Finally, we must consider the content of the course. For the sake of information we might wish it to be as extensive, as varied as possible; for the sake of thoroughness it must be intensive. It seems to me that the latter consideration must have priority; that repetition and drill in methods is more important than the variety of experiences and accumulation of knowledge of comparatively unusual conditions. The student must have indeed "the mental accumulation of essential facts immediately available for use" which Dr. Wilbur has set down as fundamental, but we cannot and ought not to make any pretense of extending that accumulation beyond a reasonable average in the space of our course. The latter cannot be expected to be all-comprehensive. It can merely set forth the usual and ordinary and frequent with perhaps now and then the exhibition of an unusual or curious case as a bit of spice as a stimulant to the interest and imagination of the student. After all, we return in summary to the fundamental idea that all we can do is to train the student. We must acquire his own experience and his own information.

DISCUSSION

Dr. Charles L. Minor, Asheville, N. C.—The subject is very important and interests me because I am in position to judge somewhat of the success of instruction in physical diagnosis in this Country. In the twenty-eight years I have worked in a resort I have of course had a great many cases sent me by all sorts of men. At all times I see a great deal of careful work, and some careless work, but I am perfectly satisfied that the average work that is being done in physical diagnosis in the United States today is far better than it was twenty years ago and is definitely on the up-grade. Mistakes are fewer and reports of findings are more accurate.

One of the things we find lacking in the teaching of physical diagnosis is a proper system, a definite routine. We all know that routine, if he is not careful and follows it slavishly, can ruin a man's work, but without a satisfactory routine he is bound to fall into error. The average student or young physician does not follow a routine. He takes some of the steps of a physical diagnosis and leaves the other alone; and yet one small step, in itself perhaps not very important, may give us the final point by which we can make a correct diagnosis. Take the matter of proper inspection, one of the very most important things. I am sure that those who teach will agree that in most cases the inspection is so slight and careless as to be made of no value at all.

I would speak also of another difficulty. Personally, I find that I cannot make a satisfactory examination of a patient lying in bed. To do thorough and satisfactory work I want my patient sitting up. I think so far as it is possible the student should work on the erect patient first, before he comes to the patient who is lying down.

Another thing that is neglected is a very careful mapping out of organs. That is very often omitted. Mapping the lower border of the lungs, mapping out the heart—all the various organs—has an anatomical as well as a diagnostic value, but I think it is often neglected.

Physical diagnosis is a question of great delicacy and care, extremely careful observation, notation, and then a logical correlation of findings. But, after all, the essence of success in physical diagnosis, outside of common sense, is a systematic and intelligent following of careful routine, from which we deduce the truth.

Dr. Louis Hamman, Baltimore, Md.—After all, physical diagnosis is the ground work of our professional activities. It will profit a man nothing to have the most detailed information about the natural history of disease provided he cannot rely absolutely upon the information he gets by means of physical diagnosis. If the facts upon which he bases his reasoning are wrong, then certainly his conclusion must be equally wrong. The method that has been used at the Johns Hopkins Hospital for a number of years is to give the second year students a preliminary course in physical diagnosis. They are taught the fundamental principles of percussion and auscultation and the technic used in the practice of these arts. In the third year the students study patients in groups of five or six. It is the object of this instruction to allow the students to do the work themselves and the instructor is there simply to help them over difficult places. In this course in physical diagnosis the students should learn to appreciate physical signs and to draw correct conclusions from them. However, it is not a part of the course to teach them the clinical course of disease. The important thing is that they appreciate the signs that are present and that they understand their significance as far as the physical condition of the organs causing the signs is concerned.

I agree with Dr. Minor as to the great advantage of having a patient sitting up in examining the lungs. I myself never feel altogether safe in my conclusions about the condition of the lungs if I must make the examination on a patient lying in bed. Gross lesions are easily detected, but I think it is difficult to be sure about the slighter changes.

I think at times too much emphasis is placed upon the terms that are used to designate the findings of percussion and auscultation. I need only remind you of the varying terminology applied to rales. The important thing is for the student to appreciate clearly and to be able to describe accurately what is seen and felt and heard, I believe at the beginning of physical diagnosis it is a distinct disadvantage to use specific terms. Students should be encouraged to tell what they observe in their own words without using such specific terms as thrills, crepitant rales, presystolic murmur, and so on. If they describe accurately what they observe and then try to infer from this observation what changes have occurred in the organs, they will have a clearer conception of the use and value of percussion and auscultation than if they describe their observation in terms that have an accepted implication. Nor do I feel that students should spend too much time in the examination of normal persons. It is important for them to do this to acquire the technic of percussion and auscultation. But, after all, what we consider normal is in contrast with the abnormal. In order to emphasize that part of the normal which it is important for the student to recognize as normal, it must be contrasted with the abnormal. No student would be able to make this important contrast from examining normal persons alone.

Dr. Frank K. Boland, Atlanta, Ga.—So far we have spoken of physical diagnosis as it relates to medical conditions, especially of the chest. I think it is well also to remember its importance in surgical conditions, especially of the abdomen. No one method of diagnosis is so important to my mind as the method of physical diagnosis. It far excels any method of the laboratory, and for this reason this subject should be well taught and an adequate number of hours given to it in the curriculum. I have noticed in some instances a tendency to turn this important subject over to young men; but I think that is a mistake. I feel, on account of the importance of this subject, that it should be handled by men not only of ability but of vast experience. I do not think a man can handle this subject well unless he has years of experience back of him.

Another point I want to make is that if this subject is not well grounded into the student at the time of his clinical work he will always be faulty in his diagnosis. If he gets good ground work in physical diagnosis in the latter part of his second year, as Dr. Lemann mentioned, it will always stand him in good stead. If he does not get the principles well grounded at that time he will always be shy on physical diagnosis.

Dr. Robert Wilson, Jr., Charleston, S. C.—I agree with Dr. Lemann that the proper place to teach physical diagnosis is in the wards. We have been using the wards for teaching physical diagnosis, and not the out-patient department, for several years, and I am confident that we get better results.

The time to begin the teaching of physical diagnosis is a mooted question. We begin in the second half of the second year and, as Dr. Lemann has said, there is a tendency now to begin even earlier. One of the weaknesses in our method of instruction is a lack of correlation between the departments of anatomy and physiology and the clinical departments. Students so often find in taking up the study of physical diagnosis that they have forgotten a great deal of their anatomy and physiology, which I believe would not be the case if these subjects were not taught in complete dissociation from the clinical subjects. The departments of anatomy and physiology could use advantageously the material in the wards for demonstrating anatomy and illustrating physiological conditions.

I am in accord with Dr. Minor and Dr. Hamman in saying that the upright position is more satisfactory than the recumbent in making physical examinations of the chest. In my own practice I usually have the patient in a sitting position unless he is too ill.

I was glad to hear Dr. Boland point out that physical diagnosis should not be confined to the chest, but should include the entire body. There has been too much of a tendency to designate physical diagnosis as meaning only examination of the heart and lungs.

Dr. W. McKim Marriott, St. Louis, Mo.—In the teaching of physical diagnosis it is important to realize that physical signs are different in children from those in adults. What may be normal in an adult is abnormal in a child, or vice versa. A student has not really learned physical diagnosis until he knows it on both adults and children, and this should be taken into consideration in any course in physical diagnosis.

In the Washington University School of Medicine we adopted some years ago the plan of teaching physical diagnosis to students in two parts, one part with adults and the other part in the same year with children.

Dr. Lemann (closing).—The real thesis I wish to present is that the teaching of physical diagnosis, as the teaching of other branches of medicine, should be a matter of scientific pedagogy. We have been physicians too much and teachers too little in relation to our students. We have let our curriculum simply grow up and have not guided it. There has been no scientific development of the curriculum as a matter of pedagogic practice. That is the thesis I wish to present.

THE USE OF THE DISPENSARY IN THE TEACHING OF CLINICAL MEDICINE*

By Louis Hamman, M.D.,
Johns Hopkins University,
Baltimore, Md.

Interest has stimulated me to hope that dispensary practice and teaching may some day be raised to the position of usefulness and dignity they deserve to occupy. It is unnecessary to say that medical work in the dispensary has not and does not now approach the standards demanded of private and hospital ward practice. The care of patients is for the greater part superficial and inadequate; students see and, therefore, are taught hurried and slovenly practice; the staff lacks enthusiasm and labors through an impossible burden of work without stimulus and without encouragement, driven on not by the reward of the work itself but by the hope of promotion that will put the drudgery behind. You may point to some clinics where these conditions do not exist, but for most dispensaries the statements are true. It is possible under proper conditions to give the highest type of medical service in the dispensary; to have an adequate and enthusiastic staff eager to profit by the opportunities presented; to teach many things better than they can be taught in the ward and some things that cannot be learned there at all; and to produce investigations and clinical observations as important as the best contributions that come from hospital ward and private practice.

The chief difficulty with our dispensaries is that up to a very recent time they have occupied a subordinate and insignificant position in the hospital organization. All thought and attention have been lavished upon the ward, and the dispensary has received scant consideration. It has been allotted inadequate quarters and equipment, and the staff has been forced to shoulder an amount of work it could not carry. In many instances it is frankly avowed that the chief function of the dis-

*Read in Conference on Medical Education, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

pensary is "to feed" interesting material to the ward. In planning the wards a specific number of beds are supplied and a staff is chosen large enough to care satisfactorily for this specific number of patients. If the beds are filled and more patients apply for admission they must be refused. Many worthy patients badly in need of medical care are turned away, but this is not thought heartless or indifferent; it is only the unfortunate necessity imposed by restricted accommodations. In planning the dispensary, available rooms are chosen often without regard to the use that will be made of them, and a staff is appointed to care for the patients. How many patients will come is unknown, but no matter how many come they must be seen in quarters large or cramped, by a staff adequate or inadequate. There is no fundamental difference between turning patients away from the dispensary because they cannot be properly cared for and turning patients away from the hospital because the beds are filled, yet the suggestion to run a dispensary on this plan has always met inflexible disapproval. It seems but common sense to urge that a dispensary be organized to do a specific amount of work. How can it be organized properly upon any other plan? Let it be decided upon the basis of available space, available money and available clientele, what number of patients can be cared for, and secure a staff large enough to give the best service to this number. If more than the maximum number apply they should be turned away and given preference upon the following day.

Another difficulty with our dispensaries is the lack of encouragement given the staff in facilities and in preferments. As a consequence, dispensary positions are held as stepping-stones to more desirable hospital connections and are gladly abandoned at the first opportunity. Apointments to ward service are eagerly sought; appointments to dispensary service are accepted as tentative and undesirable drudgery. Burdened with an impossible task, the dispensary physician hurries away patient after patient shamed by the consciousness of superficial attention. During the time that he might see three or four patients without unnecessary haste he has often to serve two and three times as many. Suitable clerical assistance is usually denied and in addition to rendering medical service he must act as his own clerk. No positions of dignity and prominence are open to reward his labors. Failing to secure a coveted ward service, he is happy if he can urge the demands of a growing practice as an excuse for resignation.

This attitude toward the dispensary is unwarranted and hampers its development. With good equipment, an adequate clerical force and a proper adjustment between the number of patients and the size of the staff, the work in the dispensary may be made as accurate, as interesting and as valuable as the work in the wards. Problems await solution in the dispensary that cannot be approached in the wards. With improvement in dispensary practice dispensary appointments will rise in dignity and importance. It will require but little change in organization to put dispensary service on a par with ward service and to make dispensary positions as desirable as ward appointments. The younger men working in a dispensary must see ahead of them promotion to reward faithful and efficient service. On the wards there are internes, a senior resident staff, a junior visiting staff and a senior visiting staff. Some similar progression must be established in the dispensary and each advance must bring with it lessened routine duties, but greater responsibility. Such positions would be worth working for and would be sufficient stimulus to command the best and undivided interest of the dispensary staff.

It is a matter of frequent comment how few clinical observations of importance have come from medical dispensaries, and how few men have risen to positions of prominence on the basis of dispensary achievement. Considering the volume of material handled in a dispensary, this is at first glance a serious criticism, but when one thinks of the inadequate facilities with which the work has been done and the pressure under which the staff has worked, it is in no way remarkable. Some important contributions have come from dispensaries and still more will come when

proper organization allows leisure and opportunity for careful observations. To the wards go mostly the acutely ill and patients in the stage of broken compensation from chronic disease. The early stage of these chronic diseases comes under observation in the dispensary, and here is one field which, properly cultivated, alone will yield a rich harvest of useful observation.

It may seem that I am hitting far from the mark to speak of dispensary organizations, when I have been asked to speak about the teaching of medicine in the dispensary, but the two are indissolubly bound together. The student learns more from the routine work that he observes than from the particular phases of the work that are culled out and held up for edification. The handling of the average patient impresses him more than learned discussion upon particular instances of disease. He must see in the dispensary as well as in the ward the kind of practice upon which he is to model his own practice in later years. I ask you teachers of medicine if you are willing to hold up the dispensary practice with which you are familiar as such a model? Until dispensary practice can be pointed to as model practice, all talk of adequate dispensary teaching is vain.

Up to the present time, teaching in the dispensary has followed chiefly two channels, the teaching of physical diagnosis and the teaching of medical diagnosis in clinics. The dispensary abounds with the most varied instances of particular lesions which the student must learn to recognize. He becomes acquainted with the instruments of his profession and learns to gather with their aid the invaluable data upon which diagnosis rests. This is the very foundation of practice. The most profound knowledge of the natural history of disease is of little use when skill in examining a patient is wanting. The teaching of physical diagnosis has usually been done in small groups in the dispensary and I believe has generally been well done.

In dispensary clinics students usually first approach the art of diagnosis. The history and physical findings are detailed and from the assembled data inferences are drawn. There is a charm about well conducted dispensary clinics that more elaborate presentations often miss. Their impromptu character calls for keen observation and brilliant inference. Can anyone fortunate enough to have attended the dispensary clinics of Osler ever forget the charm with which he invested them? In such off hand contact with patients his clinical skill rose to its highest level and his great teaching powers were most brilliantly displayed.

The criticism has been made that dispensary clinics give only a cross section of disease, a vivid picture of an illness at a given moment of time. The development of symptoms, the progress of the disease and the modification of the progress by treatment are missed. We should, of course, aim to give students a clear, consecutive picture of the natural history of disease. They should also be given the opportunity to test the accuracy of diagnostic predictions by the subsequent course of events. As dispensary organization improves and a closer watch is kept upon patients it will be simpler to follow them throughout their illness. In some clinics students follow the patients they present and keep the class informed as to subsequent developments.

The one phase of dispensary teaching that has not yet been developed is the diagnostic study of the routine patient. Students acquire a degree of practice in history taking and have their physical findings more or less carefully checked, but there is no opportunity to follow the study of the patient from beginning to end. Such a study comprises the history, the physical examination, the necessary laboratory investigations and detailed examinations in special departments. When all of these data are accumulated the final diagnosis is made and a plan of treatment suggested. This represents the

most difficult and finished type of dispensary teaching, the actual introduction to real practice. In order to carry it out successfully the dispensary must be organized on a higher level than most dispensaries at present are. Not only must the work of the medical department be carried on satisfactorily but the system of consultation with special departments must work expeditiously and efficiently.

To profit by such instruction the student must have finished his training in the fundamentals of clinical observation and laboratory technic. Most dispensary teaching is now done in the second and third years. Physical diagnosis and dispensary clinics belong properly to that period of study but it seems to me that before his fourth year the student is hardly ripe for the difficult and intricate problems that dispensary diagnosis presents. In the ward nearly all of the patients are acutely or seriously ill and present clear cut pictures of disease. In the dispensary the most varied material is encountered and it requires the highest skill successfully to analyze the situations presented. Here patients with serious complaints and minor ailments contrast with the patients who complain lightly and yet harbor mortal disease. Here are the wrecks of economic pressure, of social distress, of infection, of the wear and tear of life. The physician must carefully and systematically scrutinize all, assort and reassemble the material, and fit his treatment to the most exacting demands. The student sees therapeutics that is not treated of in pharmacology, that touches religion, sociology, hygiene and all the other varied activities of man.

In this medley of complaints and disorders full of clinical and human interest, the student finds a counterpart of what his own practice will later be. The dispensary cannot teach medicine as it should be taught until it shows the student a model of what this practice rightly attended to may become.

Discussion follows paper of Dr. Cohn, page 314.

THE USE OF THE DISPENSARY IN THE TEACHING OF CLINICAL SURGERY*†

By Isidore Cohn, M.D.,
Professor of Clinical Surgery, Tulane University,
New Orleans, La.

A dispensary represents a community service. It should be an institution of mutual service, equal to the lay community and to the medical profession. This ideal can only be realized when certain fallacies which exist in the minds of the profession have been corrected.

The chief among these which should occupy our attention are:

(1) A dispensary should not be regarded in the light of a feeder for an indoor service.

(2) It should not be considered a dressing station.

(3) The prevalent idea that the most inexperienced recent graduate should be allowed to have charge of a dispensary unsupervised is harmful to the patient and the physician.

When regarded as an admitting dispensary, perfunctory service is given to cases other than prospective operative cases; when utilized as a dressing station an orderly may well substitute the attending surgeon; and when left to the most inexperienced members of the staff, the patient fails to receive the highest type of service and the attendant may develop habits which will not bring out the best which he is capable of producing.

In the recent great war the fallacy of having the most inexperienced at or near the front was soon realized and operating teams having the best men soon replaced them.

If teaching is to be done in the dispensary, I hold that we must have some of the most capable men attached to the staff to do this teaching. Let me state at the outset that I hold that the dispensary is one of the most valuable assets of our

*From Surgical Division, Touro Infirmary.

†Read in the Conference on Medical Education, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

curriculum when the teaching is done with a view of rendering service.

Clinical surgery as taught in an ideal clinic is as valuable as bedside instruction on the medical service.

At Tulane one of the most valuable teaching clinics has been the so-called "Dry Clinic" of Professor Matas on Thursdays. Cases are presented to the classes and differential diagnosis and treatment are discussed. It is not such a thing as can be prepared by the lecturer, nor have we typical text book pictures to present.

In a modest way others may organize a dispensary for teaching clinical surgery. When teaching is to be done it is essential that the instruction of students will not interfere with the service to be rendered the patient. In order to accomplish this one must have qualified assistants who will "carry on" during the hour of class work.

It has been our policy to give instruction in a room apart from where the ordinary dressings are done.

Some may ask what are some of the advantages of teaching clinical surgery in a dispensary?

As a teaching institution from the surgical point of view the dispensary offers opportunities for a review of anatomy and the application of your knowledge of the subject for the benefit of the patient. This may well be illustrated in the teaching of fractures. The proper knowledge of muscle origin insertion and action can be taught. When this is understood the student can follow logically the application of methods of reduction which attempt to bring about an equilibrium of forces. Without such a knowledge of anatomy the student must memorize the particular methods taught. I hold that the ideal method of teaching any subject should be analytical and synthetic and not a memory test. Teachers in dispensaries must of necessity be students of experience and not recent graduates.

Every effort should be made to combat as far as possible memory work and substitute for it methods of logical deduction.

Teaching clinical surgery in dispensaries develops the powers of observation. It should be made clear that I am not advocating individual case work but rather demonstration of individual cases to small groups of students. It is not our policy or belief that dispensaries can be utilized for teaching clinical surgery if one teacher in a limited period "farms out" a case to each of ten students and then spends a few minutes with each student on his case.

In a dispensary one can demonstrate the principles of surgery which the student has been taught in the didactic courses.

This presupposes that teaching is being done in well organized dispensaries where the principles of asepsis are considered as sacred as they are in the main operating rooms of the institution. There is no better place for teaching traumatic surgery of the ambulant type.

Differential diagnosis can be taught particularly well in a dispensary if the surgeon has vision. Since one cannot always have on hand for purposes of differentiation the various conditions with which the case in point may be mistaken, he can at least have a fairly adequate substitute by collecting photographs of type cases which come under his observation. For example, a patient presents a cervical mass. If one has collected a series of photographs of the many conditions, benign or malignant, acquired or congenital, acute and chronic infections, blood dyscrasias and the like, the student can be and is interested by such discussion.

Without such a presentation the student may be prone to make a diagnosis which will be proven wrong by one who has been taught by more careful and painstaking methods.

The student in after life reflects the character of his teachers to some extent. It adds to the glory of the institution and to the satisfaction of the teacher if he has served as a stimulus for others. The dispensary offers such an opportunity in the teaching of clinical surgery.

METHODS

It has been suggested that the methods adopted in our dispensary might prove of interest.

A case is presented to the class. If it is an injury the history is obtained. An attempt is made to have the student real-

ize that loss of function is the result of a loss of equilibrium of forces and that in order to interpret this disability properly he must know the groups of muscles which have been rendered inactive by the accident. Students are taught to make their examination in a systematic manner by inspection, palpation, mensuration, the roentgenogram, and manipulation.

Great stress is laid on the value of inspection. The attitude of the patient, change in the axis of the limb and other evident deformities must be noted by the student.

We are all too familiar with the tendency to lay hands on the patient to determine the points of abnormal mobility and crepitus. Our students are impressed with the idea that by a properly taken history, inspection and gentle palpation one can often arrive at the diagnosis, provided he interprets what he sees in the light of his anatomy.

In the course of the examination of an injury about a joint, all of the possible conditions are discussed and eliminated so far as possible.

The proper interpretation of the x-ray plate is freely discussed, particularly if the patient happens to be a child. The normal epiphyses are so often misinterpreted as fractures and epiphyseal separations that we illustrate each joint at all ages by lantern slides. In this way the student becomes familiar with a subject about which there is a rather general misunderstanding.

The class witnesses the reduction of the deformity and the application of the proper splints. All of the dangers incident to improper splintage and bandaging are discussed, when possible cases of Volkmann's ischemia are presented, to illustrate one of the complications which should make them, as conscientious men, consider the subject of their work seriously.

A case is then followed during its aftercare. In our dispensary, wound treatment is discussed and illustrated. The students have the opportunity to see the value of debridement and the various antiseptics.

Infection of the hand and finger felons, tendon sheath infections and the like are discussed after the plan of Kanaval and the principles of treatment applied in the presence of the students. Differential diagnosis of any surgical condition can be taught in the dispensary in as satisfactory a manner as anywhere else.

The lantern slide, photographs, specimens and x-ray pictures are valuable aids in teaching.

One thing is necessary beside material with which to teach, that is, enthusiasm on the part of the teacher.

DISCUSSION

Papers of Dr. Hamman and Dr. Cohn.

Dr. Randolph Lyons, New Orleans, La.—It seems to me that the present status of the clinic makes teaching difficult. In other words, until medical men themselves, and lay people, appreciate the value of much better clinics and what they can do for humanity, teaching will be difficult in clinics. One of the reasons for this Dr. Hamman mentioned—insufficient help. The majority of clinics are overcrowded. They do not limit the number of patients, so that when it comes to teaching medicine in the out-patient department it is a difficult problem. In the wards in New Orleans we are very fortunate in having a great deal of material, and we are able to use for teaching purposes in many instances patients who are able to sit up, although I must say that I do not think the examination of patients in the reclining position is good experience, not only for the student but the physician, because we all have to examine many of our patients in bed and it certainly does make the physical signs more difficult to interpret. For instance, the respiratory sounds over a lung that is compressed by the patient's lying on the side are certainly different from those in the lung which is not compressed.

These points, while small, are important, and I try to bring them out to my students, that we ought to expect different signs in a patient lying down from one sitting up.

I appreciate Dr. Hamman's paper very much because he has pointed out the evils that most of our clinics have to contend with. If we could have clinics such as he describes, with the proper amount of clerical help, the proper amount of space, and limited number of patients, it would be an ideal place to treat patients and teach medicine.

Dr. Douglas VanderHoof, Richmond, Va.—I would like to think that these two papers could be given wide circulation. We realize that it is in the dispensary that the student gets his first introduction to clinical medicine, and the responsibility for teaching there is great. Yet, as Dr. Hamman has brought out so clearly in his paper, the dispensary teaching leaves very much to be desired. Of course it is true that we have good, bad and indifferent dispensaries; but I would like to see, from the standpoint of our effectiveness as teachers, a survey made of the teaching dis-

pensaries throughout the Country. I remember so well in my student days the contrast between the work in the dispensary and in the wards. It is not so many years ago that in the dispensaries in this section of the Country practically no laboratory work was done on the patients. We had one microscope that stood on a window sill, and once in a while a little fresh blood was examined under it. Urine examinations were not made. Then by contrast in the wards we found the patients well studied. In some respects it would be better if the dispensary could be eliminated and if the student got his first introduction to clinical medicine in the hospital ward where he could see the patient properly studied.

I have done a good deal of teaching in the dispensary, and have always dreaded it, for the reason that while in the course of private work one may see four or five patients a day that can be adequately studied, in the dispensary one may see in two hours ten or fifteen patients, who as a rule are not intelligent enough to give any assistance in taking the history or when it comes to discussing treatment. How much more difficult it is to try to treat a stupid individual than one who is intelligent! I have often said that the best patients I have are lawyers. I would rather treat them than any other class of individuals, because they are trained to accept facts and analyze them.

Then again, the personnel of the teachers has been rather indifferent. As Dr. Hamman said, teaching in dispensaries has been relegated to men who have not had experience in teaching in the wards. Recently in the Medical College of Virginia we have put into effect a little scheme that I think will prove helpful. We have what we think is a very good dispensary. All patients have routine blood and urine examinations made, including the Wassermann test. In this respect the dispensary is good, but we have always had difficulty in manning the medical department in the dispensary. Now we are putting into effect this scheme: each chief of clinic is asked to choose his own assistants. Each chief serves six months, coming to the dispensary two days a week. We encourage the chief to select his own assistants, men who are friends of his and will be loyal to him and work with him harmoniously and try to establish an excellent clinic; men who will be faithful in their attendance. Then we encourage the chief, if he is especially interested in one phase of medicine, to emphasize this, so that gradually we hope on Mondays and Thursdays, for instance, to have those patients that are suffering with gastroenterological troubles; on Tuesdays and Fridays, heart cases; and on Wednesdays and Saturdays, another group of cases, etc., having the men who are interested in certain phases of internal medicine take care of a certain class of cases. Of course they all have to take care of any patient who first applies on that day. We are not trying to specialize within the department of medicine, but we are trying to arrange certain clinics on certain days.

I think Dr. Hamman's paper was unusually clear, and I think the most important point he brought out was the fact that if we could limit the attendance of patients at the dispensary each day we certainly could do much better work.

Dr. M. L. Graves, Galveston, Tex.—I think we are indebted to Dr. Hamman and Dr. Cohn for their effort to dignify the dispensary service. Until that is done we shall find that it will continue in its more or less dull and deadly routine. Yet all have their individual problems. When we visit the larger clinics of the Country, such hospitals as the Barnes Hospital, in St. Louis, and see their elaborate out-patient departments, their staffs and their fine organizations, it is sometimes discouraging to men from a smaller institution where they have smaller quarters and a smaller clinic to handle the patients.

At Galveston for a number of years we had great difficulty with the out-patient service in the dispensary. Then we reorganized, and it has been working much more satisfactorily. That clinic is now in charge of one of the associate professors of the institution, who acts as general superintendent of the service and as executive officer directs its functions. The medical clinic in my own department is in charge of the associate professor of medicine, who has had years of experience as a teacher of laboratory methods, and also as a teacher of clinical medicine. We do put new members on the staff of the dispensary, but associated with the experienced. All the members on the medical staff successively serve in the out-patient department, and they are under the supervision in my department of this associate professor of medicine who has had experience. There is an effort to make the teaching service not merely second in importance to the treating service, but a very important and coordinate branch of the service. We send our men into the clinic for two-hour periods three times a week, because we feel that if the men go only twice a week or less they will not be able to keep track of their cases sufficiently well to utilize the highest clinical values.

Then, too, there are problems that confront some of us in the South that do not confront those in the East, where you have no color line. Where we have a large negro and Mexican population and they have to come to the same clinic, unless we have a large amount of room and a well organized staff, there is a tendency on the part of the negro class to limit the teaching value of the white cases. I feel if these clinics could be organized as we are going to do, with separate departments, particularly in separate buildings, with the staff well organized, we would have not only the highest teaching value for the students, but the best service to the patients.

Dr. Charles L. Minor, Asheville, N. C.—I cannot agree with Dr. VanderHoof. He does not think that the student should go first to the dispensary. Dr. Hamman, on the contrary, thinks the dispensary represents the patients the student will have when he gets into practice; and I think Dr. Hamman is right. The difficulties are great, but, after all, in the dispensary, if it is run properly, you get exactly the conditions that the young man will get in his office: the sizing up of the case quickly, the proper taking of history,

i. e., meeting the thing without all the assistance he has in the wards. He cannot have all these things in his office. Do you not remember when you first came out of the hospital how you missed the nurses' help when you had to do it "on your own?"

Dr. Hamman has put his finger upon the fundamental point, that dispensary positions are a temporary stop-gap which men do not regard seriously. If there is some way worked out by which dispensary positions can be made desirable, so that an active physician can still enjoy his association with the dispensary, then dispensary practice can be shown to the students in the right way. The student will not have all the assistance he has in the ward, but when a patient walks into the office and sits down you are confronted with the same thing as in the dispensary. I think the dispensary is the ideal place to introduce men to the practice of medicine.

Dr. Robert Wilson, Jr., Charleston, S. C.—These papers are of great importance, indicating one of the weak points in clinical teaching, and at the same time emphasizing the immense value which dispensary instruction has in the teaching of medicine.

It is almost the universal custom for the student to receive his first introduction to medicine in the dispensary, but I question if it is wise to do so. I am inclined to believe that senior students would get a great deal more out of the dispensary if they had been prepared by work in the wards. Patients also would receive better service. In the dispensary we see ambulant patients whose symptoms are often rather vague, and more experience is required to handle such cases than is possessed by junior students. If the student had his first contact with medicine in the wards, where he meets well developed cases and where he has the opportunity for much more careful study, he would be in a better position to analyze the early cases which he meets in the dispensary.

In our school both junior and senior students serve in the dispensary, the juniors acting as assistants to the seniors. I am not sure that we have worked out an entirely satisfactory system, but I believe that both students and patients receive more benefit than if juniors alone were assigned to the dispensary.

Another weak point in the dispensary is the lack of social service. Even in small schools I think that we could develop a better social service, and I am sure that it would be of immense value in dispensary teaching.

Dr. Tom A. Williams, Washington, D. C.—In the first place, dispensary patients are of two kinds: there is the patient who upon diagnosis is admitted to the hospital and becomes a hospital patient; and there is the patient who is treated as the ambulant patient. It is with the latter that we deal, in reality. The ambulant patient is in need of treatment and care which extends far beyond what can be done by giving a prescription or by minor surgical treatment in the dispensary. It extends into his care at home, to the recognition of conditions that made him sick. In order that this may be done it is necessary that home conditions be diagnosed and dealt with. There must, therefore, be either a thoroughly organized social service department to do that, or the kind of plan which was in force when I studied medicine in Edinburgh. That consisted of a certain number of students—those studying under a certain physician who was in charge of a certain dispensary affiliated with the medical school—being expected to take charge of the patients who came to the dispensary, or who were sent there for medical aid, go to their homes and behave toward them exactly as a physician would behave toward patients who are paupers and not able to pay. I gained my most valuable experience in adaptation of clinical methods to the conditions we find in poor homes in that way, because my own physician, who was supposed to consult with us in our difficult cases, never once came to see a patient with us. That threw me on my own resources, and I really learned more than if he had told me what to do.

It does not seem to me beyond the point of practical organization to arrange so that students can visit patients in their homes—students who are properly accredited in the dispensary service. Surely the junior student is better than a social worker. He knows more; he has a better education, and is more interested in the particular problem as a medical one.

As to junior and senior students, I think, as Dr. Wilson says, that the work of the dispensary would be better accomplished by senior students. The weakness is that the student has become set in his mind both in the treatment patients receive in hospitals and the assistance he receives there, which takes a great deal of responsibility from his shoulders, whereas in private practice he has to assume all the responsibility. Therefore, it seems to me it is better to have the junior student go into the dispensary and observe problems which he cannot solve because he has no knowledge of them, but which he can keep in mind in his future study of clinical medicine and find the solution to some of these problems in the hospital. Then in the senior year let him be given an assignment for three months to follow up patients: follow individual patients from the dispensary to their home; be responsible for these patients to the dispensary; and visit them as often as he wishes. He is as well equipped as we can make him to deal with these problems, and he will gain immensely in ability to deal with the problems he has to face when he goes into practice and which he does not face at present. It does not seem to me it will mean an undue consumption of time in proportion to the great benefit that will be gained. Furthermore, it would greatly increase the efficiency of the hospital for medical relief, because it is impossible at present to carry out in the hospital the things that should be carried out. Even the Massachusetts General Hospital feels it quite fails in that regard were it not for its social service group. It seems to me the assistance of medical students in small places, especially in the South, would be of great benefit to the hospital, to the medical school, and to the city in which it is situated.

Dr. Lewis J. Moorman, Oklahoma City, Okla.—I was much interested in what Dr. Hamman said about the limitation of the number of patients in keeping with the capacity of the dispensary, and also with reference to the practice of placing the younger, inexperienced men in dispensary practice with the understanding that the older men of ability are to be left in connection with hospital and ward practice. I have often thought, from my own experience and from observation, that the greatest handicap to successful dispensary work is the fact that we have more patients, as a rule, than can be properly handled.

Since we are more apt in dispensary work to get diseases in their early stages, I should like to emphasize further the importance of careful history taking, especially since the earliest manifestations of disease are usually through symptoms, and symptoms are to be carefully and properly correlated through careful history taking. I think this is very important. I believe it was McKenzie who, in commenting upon the question of the younger, inexperienced men being placed in dispensary work, said that often cases are kept under observation for a time, their symptoms being studied, and by and by when gross anatomical changes are demonstrable, it is thought advisable to refer patients to some more experienced staff member, when it is often too late to get the best therapeutic results.

Dr. I. I. Lemann, New Orleans, La.—At Tulane we have had some variations of the method suggested by Dr. Hamman. We have third-year students in the wards and fourth-year students both in the wards and in out-patient clinics.

Dr. Hamman (closing.)—I feel that the discussion has missed the one important point I wish to make. Perhaps it has been passed over because it is perfectly obvious. It seems to me it is of relatively little importance whether third-year students or fourth-year students work in the dispensary. The one important matter is that the dispensary be organized to do its work in an efficient way. When new hospitals are erected the organization of the dispensary should be an important part of the plan. As I have said, it should be planned to meet a specific and definite demand. The space and the number of physicians working in the dispensary should be accurately proportioned to the number of patients admitted. Without such planning no dispensary will work efficiently.

Dr. Cohn (closing).—In regard to the fundamental problem which Dr. Hamman mentioned—planning the hospital for beds without regard to the out-patient department—the way we got at that in planning the new addition to Touro Infirmary was this: we have planned a five-story building, the ground floor to be devoted to the dispensary. Each man in charge of the dispensary has been approached both by the architect and the superintendent to find what his needs are. When the architect (who is a hospital expert) was down there he asked, "What do you need so much room for?" We need it to handle the patients properly: for treatment rooms, for operating facilities.

If you want men to do their work well I believe you must do what someone inferred could not be done in a dispensary, that is, get proper cooperation of your various staffs for consultation. It can be done and done more readily in the dispensary than in the hospital. One morning we can take a patient with a vague pain in the shoulder and refer him to the laboratory for a Wassermann, to the x-ray department, to the orthopedic man, and have him ready for the class at the next meeting. It is necessary to have an organization, it is necessary to do the thing which the Doctor says has not been done, namely, stimulate your associates so that a position in a dispensary will be honorable. We are trying to do that as far as possible in our work at Tulane. I do not, however, agree with Dr. Williams that social work is better done by the junior and senior students. I think most of us do not understand what a good social worker can do for us.

THE TEACHING OF A SURGICAL SPECIALTY*

By M. F. Arbuckle, M.D., F.A.C.S.,
St. Louis, Mo.

During the past decade, but especially since the war, much thought and effort have been expended upon the problem of improving the methods of training students in oto-laryngology. From the results of this work, and from several years of practical experience in undergraduate and graduate teaching in the Washington University School of Medicine, we feel that the ideal arrangement is a properly equipped out-patient department of a medical school with hospital accommodations. Under this arrangement it is, of course, necessary to instruct undergraduate as well as graduate students. It is better to keep the undergraduate and the graduate students separate.

The undergraduate should first of all be reviewed in anatomy. He should then be taught the names and method of using the various instruments required in examining patients. Operative work of any kind is, of course, out of the question for the undergraduate, for no man should be taught operative technic until he has learned to recognize the indications for surgical treatment.[1] Didactic lectures

*Read in Conference on Medical Education, Southern Medical Association, Sixteenth Annual Meeting, Chattanooga, Tenn., Nov. 13-16, 1922.

are necessary and important for the undergraduate, but he must also have actual clinical experience. If he becomes sufficiently deft to see the various parts and recognize the landmarks and their appearance in the normal, and if he gets a good idea of the very important relationship of disease in this region, in many instances, to other bodily ailments, then we shall have done our duty by him and it is all one can hope to accomplish in the short time available in the present curriculum.

The teaching of graduate students is a very different matter. Applicants for this kind of instruction come from many and widely varying situations. They may be as specialists. Others wish to become well qualified, competent specialists. Still others wish to obtain further training in some sub-department of the specialty. The interne in general hospitals frequently wishes to learn the technic of tonsillectomy or submucous resection, etc.

For the men who wish, as general practitioners, merely to be able to recognize the normal, a short review of the anatomy and pathology, with a few weeks of daily clinical work, should suffice, and this is a service which our medical schools should render.

For the man who wishes to become a specialist, a very thorough course in anat-

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8 a. m. to 10 a. m.	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Cadaver Operative Work Ear, Nose and Throat	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds	Barnes and Children's Hospitals Diagnosis, Treatment and Surgery of the Ear, Nose and Throat Ward rounds
10 a. m. to 12 Noon	Library	Library	Library	Library	Library	Library
2 p. m. to 4 p. m.	Clinical Diagnosis and Treatment of the Ear, Nose and Throat	Section "a" Clinical Diagnosis and Treatment of the Ear, Nose and Throat Section "b" Nasal Operations	Clinical Diagnosis and Treatment of Ear, Nose and Throat	Section "a" Clinical Diagnosis and Treatment of Ear, Nose and Throat Section "b" Nasal Operations	Section "a" Clinical Diagnosis and Treatment of Ear, Nose and Throat Section "b" Nasal Operations	Clinical Diagnosis and Treatment of Ear, Nose and Throat
4 p. m. to 5 p. m.	Didactic Lectures Diseases of the Ear, Nose and Throat	Lecture on Clinical Rhinology by Dr. Sluder	Anatomy Ear, Nose and Throat July 1 to Jan. 1 Pathology Ear, Nose and Throat to July 1	Clinical Pathological Conference Department of Pathology	Didactic Lecture Ear, Nose and Throat	

men who have only just completed their interneship in a general hospital or they may have been in practice for a number of years, frequently having done special as well as general work. A year's interneship in a general hospital should be the minimum preliminary training accepted for matriculation in the post-graduate department. Men who have had a few years in general practice do better as graduate students.

Some of these men wish to learn only enough of diagnosis and local treatment to enable them to recognize the normal and thus better to carry on with a general practice, without pretending to do surgery omy, gross and minute, and in pathology, gross and minute, should be given. Much of this work must be done alone, but according to a definite outline. He should be familiar with the physiology of the special senses and, of course, with roentgenology, bacteriology and serology. The physics of sound is important. In the latter half of the course, surgical technic on the cadaver should be taught.

The minimum time for such a course should cover a period of twelve months and new students should be accepted at stated times at least twice a year. One-half of the day for the entire year should be devoted to clinical work and the remaining

part to laboratory work and reading. About 75 per cent of the time allotted to clinical work should be spent in the much more important and difficult problem of learning to examine patients and make proper diagnoses and in becoming familiar with the indications for surgical treatment. During the latter part of this time the student should assist at operations.

The remaining 25 per cent of the time allotted to clinical work should be utilized for the teaching of operative technic and post-operative treatment. The student, in order to learn to operate, must actually do the work himself, of course under supervision.

Much valuable work is to be had by the resident on the special services in a general hospital. Up to the present we have not had a resident on our service in the Barnes and Children's Hospitals, but the position of externe has been created. This is filled by men selected from our class of graduate students. It is considered very much worth while by the men who have held it, since they have access to all the house consultations and special cases as well as the operative work of which they actually do a very considerable portion.

In learning to examine patients and make proper diagnoses, a definite outline of procedure should be followed, a typewritten copy of which should be supplied to each student. With this outline to follow, especially at first, students can more readily be led to proceed independently, thus learning self-reliance in coping with any problem presented. After the student has examined a case and written down his impressions, his work should be gone over by an instructor. This will provide an opportunity for discussion of difficult cases and correction of possible errors.

While looking over the work of the student, it is essential constantly to remind him of the great importance of cooperating with men in other fields. For example, cases in which extreme headache, choked discs, dizziness, vomiting, etc., exist should, by all means, be carefully gone over by the neurologist and the oculist. Cases in which there is paralysis of one or both vocal cords should have a careful general and neurological examination. Frequently the only visible clinical evidence of syphilis, either recent or of long standing, is to be found by the oto-laryngologist. He must ever keep in mind that many constitutional diseases, both in children and in adults, frequently have their beginning in some focus to be found in his field. If students who are being trained in this or any other surgical specialty be thoroughly impressed with the importance of learning to recognize the indications for surgical interference before troubling themselves to learn the operative technic, there would be fewer unnecessary operations. If many so-called specialists had a proper conception of the anatomy and pathology, there would be fewer ill-advised and useless operations upon the nose and throat.[2]

Specialists, already recognized as such, occasionally desire further training in some subject. Many of these men are well grounded in the fundamentals and they can, in a much shorter time, secure additional training which will be of the greatest help and benefit to them and to their patients. Such courses can best be provided by special arrangement.

After a graduate student has had a year's work as above outlined, he will profit greatly if he take at least six months' further training in clinical work.[3] The ideal method of doing this is by interneship in a special hospital which has a well equipped out-patient department, or as resident on the special service of a general hospital. His time should be equally divided between the study of cases from a diagnostic viewpoint in the out-patient department and hospital work, of which a great portion will be operative. In this way the surgical work does not overbalance and tend to make the student forget the importance of painstaking examination necessary for establishing proper diagnosis.

The hospital interne on general service who wishes to learn operative technic in nose and throat should be made to understand, both for his own good and for that of his future patients, the necessity for his being able to recognize the indications for surgical interference before learning to operate.

It has been recommended by the Committee on Graduate Teaching of the Section on Oto-Laryngology of the American

Medical Association that men who propose to set themselves up as specialists should be required to present a certificate of proper training from an institution which, in turn, is known to be adequately equipped for such training.[4] To this recommendation we do most heartily subscribe. The writer was astonished recently by the information that an order had been issued from headquarters in Washington that trainees in the Veterans' Bureau who wish to become eye, ear, nose and throat specialists may have only nine months' training, a period manifestly insufficient in which to learn any one of the specialties.

If, regardless of the extended efforts on the part of men who stand very high and who have been delegated by the profession to devise methods for improving the quality of the training offered to the younger men who are coming into the specialty, such an order as this is allowed to continue in force, it will be a long step in the wrong direction. It indicates that there has been a failure to perceive the incompatibility of short terms and adequate training.

REFERENCES

1. Journal A. M. A., Vol. 79:365, July 29, 1922.
2. Minnesota Med., Vol. 4:419, July, 1921.
3. Bulletin A. M. A., Vol. 15:40, January 15, 1921.
4. Bulletin A. M. A., Vol. 15:40, January 15, 1921.

DISCUSSION

Dr. H. W. E. Walther, New Orleans, La.—I feel that the teaching of the specialties is the biggest storm center in medical teaching. I can recall very well my mental state in relation to the specialties just after I graduated, and what I was supposed to have learned in the undergraduate school about the specialties. It certainly was very vague and I was tempted to admit that I knew nothing about them. I think that holds equally well for the graduate of the medical school today. The undergraduate school, however, is in a very peculiar position. It must give some instruction in the specialties, for it has the responsibility of training not only the man who is going to practice in a medical center, but the man who goes to the small town and who will not have at his command his confreres in specialty work who can help him out of a tight place. He must do a great deal of semi-specialist work himself as cases present themselves, and for that reason the undergraduate medical school must do something toward making the medical student acquainted with the specialty side of medicine, and this is undoubtedly a hard thing to do.

Certainly the teaching of the specialties resolves itself more into post-graduate work. I am glad that Dr. Arbuckle brought out the point about the time of teaching the specialties. Certainly the ideal time is from one to two years, and I believe we are all in our post-graduate schools coming to feel that way, and almost to demand that the six weeks' post-graduate work be a thing of the past. In this instance we cannot bow to the demand to have such a course. Either in eye, ear, nose and throat, dermatology, urology, or what not—we cannot give these short courses and stand behind them. The man who is preparing for special work in medicine must devote at least one or two years to it to be in any way competent and to deserve the cognomen of specialist in medicine in that particular line.

This is a very important subject and it is one upon which the profession will have to work in the future. The status of the specialty branches in the under-graduate school is certainly one that will have to be revised a good deal in order to decide just exactly how much to give a man.

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C. P. LORANZ, Secretary-Manager

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
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FATALITIES FOLLOWING MINOR OPERATIONS UPON THE NOSE AND THROAT

In view of the comparative paucity of reports of fatalities following nose and throat operations and the tremendous operative activity of oto-laryngology, it is of interest to note a compilation of fatality reports which occurred in different parts of the Country. Dr. H. W. Loeb* sent out letters of inquiry to 5000 practitioners, and from approximately 700 replies obtained reports of 332 fatalities, which followed operations not generally considered serious.

Meningitis was the cause of death after 120 nasal operations, and hemorrhage in 55 of the other cases. Death followed tonsillectomy in 126 cases.

The causes of death are thoroughly analyzed by Dr. Loeb. Meningitis occurred most frequently after those operations which came into relation with the lamina cribrosa. It came on as a rule within twenty-four hours after the operation, and was usually best explained as due to a fracture into the cranial cavity.

The main causes of death after tonsillectomy were hemorrhage, respiratory complications, and general sepsis.

This is a rather startling report. Whether these fatalities could have been prevented, and how to reduce to a minimum the future mortality from the operations usually known as minor, is the problem of the specialists in this line.

Some suggestions of Dr. Loeb may be mentioned. The operator should have a thorough knowledge of the anatomy of the nose and throat, which can be gained only by arduous study in the dissecting room. In other words, there should be a high standard of qualification for specialization in this line as in all others. There should be careful pre-operative study of the patient and if possible hospitalization. The attention to asepsis should be, as far as possible, the same as for a major operation.

*Loeb, H. W.: Annals of Otology, Rhinology and Laryngology, XXXI, 2, 273.

ANAPHYLAXIS IN EVERY DAY PRACTICE

Anaphylaxis in the ordinary medical use of the term occurs when certain troublesome symptoms follow the ingestion of certain foods, such, for instance, as strawberries, egg albumin, and shell fish. The reactions are probably due to protein sensitization which in a majority of instances could be demonstrated by proper methods of diagnosis.

Drug idiosyncrasy as seen with iodids, bromids, iodoform and various alkaloids is looked upon by many as being an anaphylactic phenomenon even though no previous sensitization has taken place. Some consider the nitroid crisis observed following the administration of arsphenamin as anaphylactic, because of its resemblance to anaphylactic shock.

Diagnostic tests are frequently used which depend upon the patient's being sensitive to a particular protein. The skin reaction in tuberculosis, or the von Pirquet reaction, is an example of this kind, as is also the luetin reaction in syphilis. There has been introduced a series of tests covering what may be called the protein index, to detect susceptibility to all common proteins.

The most prominent of the diseases due to anaphylaxis are asthma, hay fever, and some lesions of the skin such as urticaria. Brilliant results are often obtained by detecting the particular protein causing the trouble and desensitizing the patient, or removing the cause by a change of food or climate.

A practical and common application of our knowledge of anaphylaxis is the custom of injecting one or two cubic centimeters of plain horse serum, anti-tetanic serum, diphtheria antitoxin, etc., as the case may be, and then waiting for three to five minutes before administering the full dose. Many a fatality has been averted by this conservative means of testing the individual's sensitization to the protein before giving the therapeutic amount.

Anaphylactic phenomena, then, are taking place daily in the work of the practicing physician. Close observation and recognition of them will assist in diagnosis and treatment, and greatly benefit both doctor and patient.

CANCER PREVENTION

The American Society for the Control of Cancer is one of the public health movements which found its inception within the ranks of the organized medical profession, and which has been, ever since it was organized in 1913, controlled by physicians.

Its object is to inform the laity that "Cancer is curable if one will but seek the advice of the family physician in time" and to give to the public the symptoms and signs of early cancer, in order that every individual may recognize a condition which may become cancer, and apply promptly for treatment.

As the American Society for the Control of Cancer is an institution working hand in hand with the medical profession, every physician should give the movement his hearty support. The problem of educating the laity properly with regard to any public health problem, which requires almost individual instruction, is apparent. The enormity of the task is realized only when one recalls that in America there are 110,000,000 laymen dependent upon the instruction of 146,000 physicians, which means that every physician will have approximately 800 "pupils" to instruct.

Great publicity must be given to the facts that cancer is not contagious; that it is not hereditary (in the lay sense of the term); that nearly 100,000 people are needlessly sacrificed yearly in the United States because they do not recognize the symptoms of cancer early and come in time for treatment; that beginning cancer is localized and in this condition curable; but that in time (and no one can predict just when) it metastasizes and is then hopeless.

The public must be made to realize that cancer takes its greatest toll from persons in middle life and hence is of the greatest economic importance.

The public is ignorant of medical matters and must be taught that advertisements (as well as patent medicines of all sorts) claiming to cure cancer are frauds and that the public salvation in this, as in all other medical problems, must depend upon the medical practitioner. Few indi-

viduals would take their automobiles to a plumber, but some of them take that much more complicated machine, the human body, to less competent persons for treatment. The public must be advised of the dangers of quacks and the various cults which ape the medical profession.

Laymen must be taught that any persistent irritation or sore, that any lump in the female breast, that any abnormal discharge from any of the orifices of the body, and that even persistent indigestion may mean cancer and can only be excluded by a thorough physical examination by a competent physician.

Correspondence

SYMPTOMATOLOGY, PATHOLOGY AND RATIONAL TREATMENT OF BOTULISM

Editor, SOUTHERN MEDICAL JOURNAL:

In the February number of the SOUTHERN MEDICAL JOURNAL there appeared an article entitled "Symptomatology, Pathology and Rational Treatment of Botulism." I wish to make this correction: that the majority of this article was taken from Public Health Bulletin 127, J. C. Geiger, E. C. Dickson, and K. F. Meyer, and of which part E. C. Dickson was mainly responsible.

Yours very truly,
J. C. GEIGER, *Epidemiologist*,
U. S. Public Health Service, and
Associate Professor of Epidemiology.
University of Chicago,
March 12, 1923.

NATIONAL BOARD OF MEDICAL EXAMINERS

Editor, SOUTHERN MEDICAL JOURNAL:

The following information concerning examinations by the National Board of Medical Examiners is announced:

Part I, June 25, 26, 27, 1923; and
Part II, June 28, 29, 1923.
Part I, Sept. 24, 25, 26, 1923; and
Part II, Sept. 27, 28, 1923.

All applications for these examinations must be made on or before May 15, 1923.

Further information may be obtained from the Secretary.

Very truly yours,
J. S. RODMAN, M.D., *Secretary*.
1310 Medical Arts Bldg.,
Philadelphia, Pa.,
March 19, 1923.

Book Reviews

Hygiene and Health. By Dr. Charles P. Emerson and George H. Betts, Ph.D. Book One, 209 pages; Book Two, 355 pages. Indianapolis: Dobbs-Merrill, 1923.

Dr. Charles P. Emerson, Dean and Professor of Medicine in the University of Indiana, and who is remembered by Southern physicians as Resident Physician of Johns Hopkins University for many years, has met the need for an authoritative text book on hygiene for use in our schools by preparing "Hygiene and Health." This two-book series for use in the middle and upper grammar school grades presents the important facts regarding personal and community hygiene in a manner that can be understood by very young children, and without the pseudo-scientific misinformation that has been found in similar text books that have been written largely by laymen.

The elementary book discusses health habits, food, air, and the care of the teeth, skin, hair, etc., in a way that is easily understood by children in the lower grades. The advanced, "Physiology and Hygiene," is the best simple physiology that the writer has reviewed. The study of this book will give to older children not only a working knowledge of applied physiology, but the important, usable facts regarding communicable diseases.

The use of such books in teaching children how to live hygienic and efficient lives means that the men and women of the next generation will be healthier, happier and longer lived than their fathers and mothers.

Orthopedic Surgery. By Sir Robert Jones, K.B.E., C.B., Ch.M. (Liverpool), F.R.C.S. (England, Ireland and Edinburgh), F.A.C.S. (U. S. A.); Director of Orthopedic Surgery, St. Thomas' Hospital; Lecturer on Orthopedic Surgery, Liverpool University, etc. And Robert W. Lovett, M.D., F.A.C.S., John B. and Buckminster Brown Professor of Orthopedic Surgery, Harvard University, etc. 697 pages and 712 engravings. New York: William Wood & Co., 1923. Cloth, $9.00.

In this, the first edition, the authors have combined the best in orthopedic surgery of two continents. The method of approach to the various subjects is somewhat new, but it is reasonable, and probably desirable, in that it stimulates thinking rather than remembering.

The discussion of the anatomy and physiology of the various joints, before taking up their pathological conditions, is of much value. The intention of the authors is carried out, in that they do not go into minute details for conditions generally well understood and for which there are already proven methods of treatment.

Conditions which have been more or less baffling heretofore, without definitely proven procedure for their treatment, are considered at length in the light of more recent knowledge. Emphasis is justly placed upon diagnosis and differential diagnosis.

There is good, useful information in all the chapters about joint pathology, but the following stand out as being especially good: Disability of the knee joint, the several chapters on tuberculosis of the various joints, arthritis deformans, spastic paralysis, poliomyelitis, muscle training and congenital dislocation of hip joint.

The diagrams, illustrations, photographs and x-rays are unusually clear and well illustrate the conditions described.

Taken as a whole, it is the best work on the subject that has yet appeared.

Montaigne and Medicine. Being the Essayist's Comments on Contemporary Physic and Physicians; His Thoughts on Many Material Matters Relating to Life and Health; an Account of His Bodily Ailments and Peculiarities and of His Travels in Search of Health. By James Spottiswoode Taylor, Commander, M.C., U. S. Navy, M.D., F.A.C.S., Member Societe Francaise D'Histoire De La Medecine. 244 pages. Illustrated. New York: Paul B. Hoeber, 1923. Price, $3.75 net.

A biography of Montaigne, especially considered in its relation to medicine. Though naturally of a rugged physique, Montaigne suffered all the agonies incident to renal lithiasis and gout. The views of this man upon physicians and remedies and his sojourn at health resorts furnish a basis for this scholarly and intensely absorbing book.

Physics and Chemistry for Nurses. Lippincott's Nursing Manuals. By A. R. Bliss, Jr., A.M., Ph.D., M.D., Lecturer on Chemistry and Materia Medica, Grady Hospital Training School for Nurses, Atlanta, Ga.; Professor of Pharmacology, Emory University, School of Medicine; Passed Assistant Surgeon, U.S.P.H.S., Reserve; Formerly Professor of Chemistry and Pharmacology, Graduate School of Medicine, University of Alabama; and A. H. Olive, A.M., Ph.Ch., Ph.D., Lecturer on Chemistry, Hillman Hospital Training School for Nurses, Birmingham, Ala., Associate Roentgenologist, Hillman Hospital; Superintendent of University Free Dispensary, U.S.P.H.S. (State, County and City); Formerly Professor of Physics and Chemistry, Howard College; Associate Professor of Chemistry, Graduate School of Medicine, University of Alabama. With 190 pages and 70 illustrations. Third Edition, thoroughly revised and rewritten and conforming to the requirements of the Standard Curriculum (1922) of the National League of Nursing Education. Collaborators, Frances W. Witte, R.N.; Ethel Johns, R.N.; Sr. Mary Alma, Ph.G., R.N.; Alice L. Lake, B.S., R.N.; Stella Ackley, R.N.; Adelaide M. Leffingwell, R.N. With 190 pages, illustrated with 70 illustrations. Philadelphia and London: J. B. Lippincott Co., 1923.

The fact that examining boards for nurses now practically routinely include questions on physics and chemistry is one of the signs of the rising standard of efficiency among candidates for the position of registered nurse. The book gives an excellent summary of the information upon these subjects so essential to intelligent nursing.

Industrial Hygiene and Medicine. By E. W. Hope, O.B.E., M.D., D.Sc., Medical Officer of Health for the City and Port of Liverpool; Professor in Public Health, University of Liverpool; Late President, Society of Medical Officers of Health; and Late Examiner in the Universities of Belfast, Cambridge, Edinburgh, and Manchester, and to the Royal College of Physicians (Lond.) and Royal College of Surgeons (Eng.). In Collaboration with W. Hanna, M. A., M.D., D.P.H.; and C. O. Stallybrass, M.D., D.P.H., Assistant Medical Officers of Health, City and Port of Liverpool; and Lecturers in Public Health Subjects, etc., University of Liverpool. With 766 pages, illustrated. New York: William Wood & Co., 1923. Cloth, $7.00.

This book is based upon the knowledge of the causation of industrial disease and the preventive methods employed in the light of this knowledge. Industrial hygiene is one of the most fruitful fields of preventive medicine for the future, and only by the study of statistics concerning the diseases and accidents to which employees are liable can any workable means of prevention be found. This is a very carefully gotten up and valuable book.

Clinical Laboratory Methods. By Russell Landram Haden, M.A., M.D., Associate Professor of Medicine, University of Kansas, School of Medicine, Kansas City, Kan.; Formerly Director of Laboratories, Henry Ford Hospital, Detroit. 69 illustrations and 5 colored plates, 294 pages. St. Louis: C. V. Mosby Co., 1923. Cloth, $3.75.

The book is a selection of laboratory procedures which Haden has found most useful in his own experience. There is no originality claimed, but the volume is a good selection of laboratory procedures.

Essentials of Surgery, a Text Book of Surgery for Student and Graduate Nurses and for those interested in the care of the sick. Lippincott's Nursing Manuals. By Archibald Leete McDonald, M.D., the Johns Hopkins University, Formerly in Charge of Department of Anatomy, University of North Dakota; Lecturer on Surgery, Nurses Training School, St. Luke's Hospital, Duluth, Minn.; Member Western Surgical Association. With 292 pages and 40 illustrations. Second edition, revised. Philadelphia and London: J. B. Lippincott Co., 1923.

A thorough and accurate book containing information well selected for its intended readers.

Polaris, the Story of an Eskimo Dog. By Ernest Harold Baynes, Author of "Wild Bird Guests," etc. With many illustrations from photographs by Louise Birt Baynes, John R. Baynes, and the author. 137 pages. New York: The Macmillan Co., 1922. Cloth, $1.50.

This is a very charming little biography of a real dog, neither sentimental nor exaggerated, but interesting throughout. It is written about a dog whose parents were among those faithful animals who carried Admiral Peary's sledges over the northern ice and snow on his trip to the Pole. It is a fascinating biography of a noble animal.

The Biology of Death. Being a Series of Lectures Delivered at the Lowell Institute in Boston in December, 1920. By Raymond Pearl, of Johns Hopkins University. 275 pages. Philadelphia and London: J. B. Lippincott Co., 1922.

Although the title suggests that this may be another attempt at popular (which often means inaccurate) science, the content of the book is an agreeable surprise. It is a very scientific and clever assimilation of material from three sources: general biology, experimental biology, and statistical science, concerning our knowledge of natural death.

Other Books Received

The Propaganda for Reform in Proprietary Medicines. Vol. 2. 603 pages. Chicago: Press of American Medical Association, 1922.

Notes on Materia Medica, Pharmacology and Therapeutics for Dental Students and Practitioners. By Frank Coleman, M.C., L.R.C.P., M.R.C.S., L.D.S. Fifth Edition. 308 pages. New York: Oxford University Press, 1922.

Practical Physics. By J. A. Crowther, Sc.D., F.Inst.P., Sometime Fellow of St. Johns College, Cambridge; Demonstrator of Physics, Cavendish Laboratory; University Lecturer in Physics as Applied to Medical Radiology, Cambridge. 260 pages. New York: Oxford University Press, 1922.

Annual Report of the Surgeon-General of the Public Health Service of the United States for the Fiscal Year 1922. 330 pages. Washington: Government Printing Office, 1922.

A Manual of Surgical Anatomy. By Lewis Beesly, F.R.C.S., Edin., Surgeon, Chalmers' Hospital, Edinburgh; Lecturer on Surgery and Operative Surgery, Edinburgh School of Medicine for Women; Lecturer on Surgical Applied Anatomy, Edinburgh Post-Graduate Courses; Examiner in Anatomy, Royal College of Surgeons, Edinburgh; Lately Demonstrator of Anatomy, Edinburgh University. And T. B. Johnston, M.B., Ch.B., Professor of Anatomy, University of London, Guy's Hospital Medical School. Second Edition. 561 pages. New York: William Wood & Co., 1923.

The Riddle of the Rhine. Chemical Strategy in Peace and War. An account of the critical struggle for power and for the decisive war initiative. The campaign fostered by the great Rhine factories, and the pressing problems which they represent. A matter of pre-eminent public interest concerning the sincerity of disarmament, the future of warfare, and the stability of peace. By Victor Lefebure, Officer of the Order of the British Empire (Mil.); Chevalier de la Legion d'Honneur; Officer of the Crown of Italy; Fellow of the Chemical Society, etc. With a preface by Marshal Foch and an introduction by Field-Marshal Sir Henry Wilson, Bart., Chief of the Imperial General Staff. With 280 pages, illustrated. New York: E. P. Dutton & Co., 1923.

Impotency, Sterility, and Artificial Impregnation. By Frank P. Davis, Ph.B., M.D., ex-Secretary Oklahoma State Board of Medical Examiners; Formerly Superintendent, State Institution for Feeble-Minded; Author of "How to Collect a Doctor's Bill;" "The Doctor's Book of Poems;" Formerly Editor, Davis' Magazine of Medicine. Second edition, revised and enlarged, with 168 pages. St. Louis: C. V. Mosby Co., 1923. Cloth, $2.25.

Practical Anesthetics, for the Student and General Practitioner. By Charles F. Hadfield, M.B.E., M.A., M.D., Cambridge; Honorary Anesthetist, Prince of Wales Hospital, Tottenham; Assistant Anesthetist and Lecturer on Anesthetics, St. Bartholomew's Hospital; Late Anesthetist, City of London Military Hospital. 243 pages. New York: William Wood & Co., 1923. Cloth, $3.00.

Nursing and Nursing Education in the United States. Report of the Committee for the Study of Nursing Education. C. E. A. Winslow, Dr.P.H., Chairman; Mary Beard, R.N.; H. M. Biggs, M.D.; S. Lillian Clayton, R.N.; Lewis A. Conner, M.D.; David L. Edsall, M.D.; Livingston Farrand, M.D.; Annie W. Goodrich, R.N.; L. Emmett Holt, M.D.; Julia C. Lathrop; Mrs. John Lowman; M. Adelaide Nutting, R.N.; C. G. Parnall, M.D.; Thomas W. Salmon, M.D.; Winford H. Smith, M. D.; E. G. Stillman, M.D.; Lillian D. Wald, R.N.; W. H. Welch, M.D.; Helen Wood, R.N.; Josephine Goldmark, Secretary; and Report of a Survey, by Josephine Goldmark, Secretary. With 585 pages. New York: The Macmillan Co., 1923. Cloth, $2.00.

The New Physiology in Surgical and General Practice. By A. Rendle Short, M.D., B.S., B.Sc. (Lond.), F.R.C.S. (Eng.); Member of Council, British Association of Surgeons; Examiner in Physiology for the F.R.C.S.; Late Hunterian Professor of Royal College of Surgeons; Surgeon, Bristol Royal Infirmary; Lecturer on Physiology, University of Bristol. Fifth Edition, Revised and Enlarged. With 330 pages. New York: William Wood & Co., 1922. Cloth, $3.75.

Southern Medical News

DATE OF LOUISIANA MEETING CHANGED

The date of the annual meeting of the Louisiana State Medical Society has been changed to April 24, 25 and 26. Note the place and the time—New Orleans, April 24-26. The House of Delegates will meet on April 23.

ALABAMA

The annual meeting of the Alabama State Medical Association will be held in Mobile, April 17-20.

Drs. R. A. Smith and M. H. Hagood, Brewton, have recently opened a thirty-five bed hospital, known as Brewton Memorial Hospital. The institution is a two-story building.

Colbert County Medical Society has elected Dr. H. A. Griffith, President; Dr. G. F. Littlepage, Vice-President; Dr. E. T. Newsom, Secretary-Treasurer.

Madison County Medical Society has elected Dr. E. O. Williamson, Gurley, President, to fill the unexpired term of Dr. C. A. Grote, who resigned to go to Greensboro, N. C.

Capt. William M. Caffee, Manila, P. I., has resigned his commission in the M.C., U. S. Army, and will open offices in Birmingham.

Dr. Hugh C. McRee, Decatur, will succeed Dr. Burton F. Austin as Physician of Morgan County.

Dr. Burton F. Austin, Decatur, on his retirement as County Health Officer, February 1, was presented with a handsome gold watch and chain by members of the Morgan County Medical Society.

The State Department of Health is making an effort to establish full-time health units in every county of the State to aid in the spring campaign against mosquitoes. The insurance companies will cooperate with the U. S. Public Health Service in the fight against mosquitoes.

Dr. John L. Gallagher, Dora, has been appointed full-time Health Officer of Limestone County.

Deaths

Dr. J. R. Howell, Florence, aged 71, died January 24.

ARKANSAS

The annual meeting of the Arkansas State Medical Association will be held in Hot Springs May 2-4.

Chicot County Medical Society has elected Dr. S. W. Douglas, Eudora, President; Dr. E. E. Barlow, Dermott, Vice-President; Dr. J. S. Wilson, Lake Village, Secretary.

Franklin County Medical Society has elected Dr. Chas. S. Allen, President; Dr. H. F. Williams, Vice-President; Dr. Thos. Douglass, re-elected Secretary-Treasurer.

Jefferson County Medical Society has elected Dr. J. M. Lemons, President; Dr. W. T. Lowe, Vice-President; Dr. J. T. Palmer, Secretary-Treasurer.

White County Medical Society has elected Dr. R. L. Little, President; Dr. J. B. Havner, Vice-President; Dr. S. J. Allbright, Secretary-Treasurer.

The Stout Hospital, Brinkley, was formally opened January 18.

Dr. Rutial O. Norris, Tuckerman, has been appointed a member of the Board of Health to succeed Dr. Cyrus F. Crosby, Texarkana.

Dr. Henry Pace, Eureka Springs, has been appointed Health Officer to succeed Dr. C. F. Ellis, resigned.

Dr. Carle E. Bentley and Mrs. Katherine Oakman, both of Little Rock, were married February 10.

Dr. Erastus L. Miller, Crossett, and Miss Fannie C. Spurlock, Lake Village, were married February 13.

Deaths

Dr. Philip A. Conner, Whitton, aged 43, died January 30 from a bullet wound in the brain.

Dr. A. Neal Wood, Ashdown, aged 57, died December 15.

Dr. Henry B. Wiggs, Russellville, aged 49, died January 29 at Colorado Springs, Colo.

DISTRICT OF COLUMBIA

It has been announced that the sum of $25,000 has been pledged by the students of the Howard University School of Medicine, Washington, and a like sum by the administration, trustees and faculty of the University in the campaign to raise $250,000 by July 1 in order to receive the same amount from the General Education Board for the School of Medicine.

Representative Focht has introduced a bill in the House to provide for the erection of a building for the care of tuberculous pupils on the Upshur Street tract of land, Washington, at a cost of $150,000.

The American Child Health Asssociation, Washington, has been formed for the protection and promotion of child health in America. The association was formed by the amalgamation of the American Child Hygiene Association and the Child Health Organization and will have the full co-operation of the American Relief Administration, under the leadership of Herbert Hoover.

Deaths

Dr. George Woodruff Johnston, Washington, aged 64, died February 20 of heart disease while delivering an address.

Dr. Joseph Robert Lee Hardesty, Washington, aged 87, died February 3 from senility.

Dr. Charles William Franzoni, Washington, aged 85, died February 17 of bronchopneumonia.

FLORIDA

The annual meeting of the Florida State Medical Asssociation will be held in Jacksonville May 14-16.

Hillsborough County Medical Society has elected Dr. J. C. Dickinson, President; Dr. R. C. Hubbard, Vice-President; Dr. C. R. Marney, Secretary; Dr. J. C. Chandler, Treasurer.

Pinellas County Medical Society has elected Dr. Ralph D. Murphy, President; Dr. O. M. Knox, Vice-President; Dr. T. R. Griffin, Vice-President; Dr. O. O. Feaster, Secretary; Dr. G. M. Lochner, Treasurer.

Included in the bond election soon to be held in St. Petersburg is an item of $150,000 for an eighty-bed addition to the City Hospital.

Deaths

Dr. Clarence M. Slack, St. Petersburg, aged 81, died January 28 from senility.

Dr. Joseph Palmer Johnson, Lynn Haven, aged 84, died December 9 from senility.

Dr. James Massey Jones, Interlachen, aged 79, died February 12 from senility.

GEORGIA

The annual meeting of the Georgia State Medical Association will be held in Savannah, May 2-4.

Ben Hill County Medical Society has elected Dr. W. D. Dorminy, President; Dr. L. E. Thornton, Vice-President; Dr. W. P. Coffee, Secretary-Treasurer.

Carroll County Medical Society has elected Dr. C. C. Fitts, President; Dr. H. J. Goodwyn, Vice-President; Dr. D. S. Reese, Secretary-Treasurer.

Fulton County Medical Society has elected Dr. H. R. Donaldson, President; Dr. W. E. Person, Vice-President; Dr. Grady E. Clay, Secretary-Treasurer.

Hall County Medical Society has elected Dr. J. L. Meeks, President; Dr. R. L. Rogers, Vice-President; Dr. Pratt Cheek, Secretary-Treasurer.

Irwin County Medical Society has elected Dr. H. P. Lyons, President; Dr. R. F. McLeod, Vice-President; Dr. L. L. Whiddon, Secretary-Treasurer.

Lowndes County Medical Society has elected Dr. G. T. Crozier, President; Dr. D. W. Freeman, Vice-President; Dr. T. H. Smith, Secretary-Treasurer.

Pike County Medical Society has elected Dr. J. C. Beauchamp, President; Dr. D. L. Head, Vice-President; Dr. M. M. Head, Secretary-Treasurer.

Stewart-Webster County Medical Society has elected Dr. J. M. Kenyon, President; Dr. J. H. Foster, Vice-President; Dr. W. F. Walker, Secretary-Treasurer.

Tri-County Medical Society has elected Dr. J. L. Cheshire, President; Dr. W. C. Hays, Vice-President; Dr. C. K. Sharp, Secretary-Treasurer.

Dr. Victor H. Bassett, Savannah, who it is alleged was dismissed from the position of Director of the Hygienic Laboratory of the Board of Sanitary Commissioners of Savannah for refusing to pay political assessments, has been restored to his position, and has in addition been made Acting Health Officer of the City during the reorganization of the Health Department. It is proposed to hold a competitive examination for the positions of Health Officer and Supervisor of Public Health Nurses and to place the positions permanently out of politics.

Dr. Alfred F. White, Flovilla, has been elected President of the State Medical Board.

Dr. Bracken, Surgeon in charge of Ashbury Veterans' Hospital, Minneapolis, Minn., has been transferred to the Government Hospital, Atlanta.

Dr. T. F. Harper, Coleman, President, Randolph County Medical Society, has left Coleman to locate in Newman, Ga.

Dr. J. H. Chandler, Swainsboro, has been elected City Physician.

Dr. Richard L. DeSaussure, Brunswick, has resigned as County Health Commissioner of Glynn County and has accepted a similar position in Ohio.

Dr. Lonnie Woodfin Grove and Miss Dorothy Haverty, both of Atlanta, were married January 19.

Dr. Henry Taylor Compton and Miss Sarah Millburn Walthour, both of Savannah, were married January 24.

Deaths

Dr. William H. Crow, Pavo, aged 52, died February 4 at Sylvester from injuries sustained in an automobile accident.

Dr. Paul Tudor Jones, Columbus, aged 71, died February 9.

Dr. Thomas Hartley Hall, Dublin, aged 85, died February 12 from senility.

Dr. Daniel Hughes DuPree, Athens, aged 39, died February 22 from angina pectoris.

Dr. Henry Latimer Rudolph, Gainesville, aged 43, died January 28 from pneumonia.

Dr. Thomas J. Kennedy, Coolidge, aged 60, died February 8 from heart disease.

Dr. Charles P. Brightwell, Maxeys, aged 47, died December 25 from influenza.

KENTUCKY

At the recent annual meeting of the Kentucky State Board of Health, held in Louisville, the following appointments were made: Dr. Philip E. Blackerby, Director of the Bureau of County Health Work; Dr. Lillian H. South, Director of the Bureau of Bacteriology and Epidemiology; Dr. John S. Lock, Director of the Bureau of Tuberculosis; Dr. Annie Veech, Director of the Bureau of Child Hygiene; Dr. Jethra Hancock, Director of the Bureau of Venereal Disease; Dr. Charles B. Kobert, Director of the Bureau of Trachoma and Conservation of Vision; Dr. Samuel W. Bates, Superintendent of the State Tuberculosis Sanatorium, Hazelwood; Dr. Frank J. O'Brien, Director of the Bureau of Mental Hygiene, and Miss Williamson, Director of the Bureau of Public Nursing.

Dr. William H. Coffman, Georgetown, has been elected President of the Scott County Board of Health.

Free physical examinations will be given to many thousands in Louisville under supervision of the faculties of the medical and dental colleges of the University of Louisville. The work will be done through the co-operation of the University officials with the Jefferson County Medical Society and the county dental society.

A "Habit Clinic," the second of its kind in the United States, has been established by the Psychological Clinic in Louisville, under the supervision of the Louisville Society for Mental Hygiene. The Clinic is for children of preschool age who show pernicious habits which, if unchecked, may become serious. The first clinic was established in Boston in 1922.

The County Tuberculosis Hospital, Henderson, which has been thoroughly remodeled and furnished with new equipment, was reopened January 17.

Tuberculosis clinics will be held in twenty counties in the State, as follows: Rockcastle, Lincoln, Fulton, Graves, Scott, Johnson, Bourbon, Grayson, Daviess, Mason, Montgomery, Clark, Mercer, Boyle, Pulaski, Henry, Laurel, Hopkins, Christian and Knott.

The Health Department of the Woman's Club, Fulton, has inaugurated a campaign to raise funds which will be expended in equipping a public clinic in Fulton, where children of school age and under, whose parents are unable to pay for necessary dental or surgical treatment, can be treated free of charge. The clinic will, in a measure, take the place of a municipal hospital.

Oldham County Health Board is composed of the following members: Dr. R. B. Cassady, Dr. E. F. Weeks, Dr. H. B. Blaydes, Dr. R. B. Pryor and County Judge A. T. Ladd. Dr. Cassady is County Health Officer and is Chairman of the Board.

Establishment of permanent headquarters of the National Health Exposition Association in Louisville was recently announced. The Association was formed by a group of state and city health officials to conduct health expositions along ethical lines and eliminate promotional methods and profits from such enterprises. The organization will maintain a permanent staff and its personnel will be sent to various cities whenever required. Dr. Geo. Parrish, Portland, is First Vice-President; Dr. Hiram Read, Seattle, Second Vice-President; Mr. R. E. Logsdon, Secretary-Treasurer. Members of the Advisory Council are: Dr. L. M. Powers, Los Angeles; Dr. H. L. Sayler, Des Moines; Dr. F. W. Almond, Boise, Idaho; Dr. R. C. Turck, Jacksonville, Fla.; Dr. Thomas Tetreau, Portland, Me.; Dr. Rodney Fagen, Des Moines; Dr. W. M. Dickie, Sacramento, Calif.; Dr. R. M. Olin, Lansing, Mich.; Dr. W. S. Rankin, Raleigh, N. C.; Dr. E. G. Williams, Richmond, Va.; Dr. S. J. Crumbine, Topeka; Dr. J. D. Dowling, Birmingham, Ala.; Dr. Oscar Dowling, New Orleans; Dr. S. W. Welch, Montgomery, Ala.; Dr. C. C. Slemons, Grand Rapids; Dr. W. S. Leathers, Jackson, Miss.; Dr. Charles Duncan, Concord, N. H.; Dr. I. H. Dillon, Lincoln, Neb.; Dr. W. C. Fowler, Washington, D. C.; Dr. Henry R. Vaughan, Detroit; Dr. C. W. Garrison, Little Rock.

A Health and Welfare League for Grayson County was recently organized.

Rowan County Health Board is composed of the following members: Dr. A. W. McClease, Health Officer; J. W. Riley, Chairman; D. B. Cornett, Morehead; Dr. J. Vinton Messer, Bluestone; Dr. Samuel Porter, Vale.

The Central Division of the American Roentgen Ray Society, at the recent meeting in Louisville, elected the following officers: Dr. D. Y. Keith, Louisville, President; Dr. W. O. Upson, Battle Creek, Mich., First Vice-President; Dr. Charles Goosman, Cincinnati, Ohio, Second Vice-President; Dr. R. C. Beeler, Indianapolis, Ind., Treasurer. The next meeting will be held in Indianapolis.

Dr. C. M. Rice, Sutherland, has been appointed a member of the Daviess County Health Board, succeeding Dr. M. H. Walker, resigned.

Dr. Frederick J. Hoitash and Miss Agnes Maria Stadler, Ashland, were married February 24.

Deaths

Dr. J. H. Forest, Murray, aged 68, died December 11 from pneumonia.

Dr. W. H. Conway, Covington, aged 79, died February 5.

Dr. Frank C. Simpson, Louisville, aged 65, died February 25 from pneumonia.

Dr. Thomas P. Caldwell, London, aged 82, died February 26.

Dr. George Hinkle, Sanders, aged 40, died February 6 from influenza.

Dr. J. M. Williams, Pikeville, was shot and killed early in February.

Dr. John W. Williams, Olive Hill, aged 80, died February 8 from heart trouble.

Dr. J. C. Wood, Bardstown, aged 88, died March 6.

LOUISIANA

The annual meeting of the Louisiana State Medical Society will be held in New Orleans April 24, 25 and 26—note change in date. The House of Delegates will meet on April 23.

Dr. Oscar Dowling, President of the State Board of Health, was a member of a party of prominent physicians and surgeons who recently were on a cruise to Central and South America. He was one of the Committee at the laying of the corner-stone of the Gorgas Memorial Institute of Tropical Medicine in the City of Panama, February 18. Dr. Belisaio Porras, President of the Republic of Panama, gave the chief address on this occasion.

The Public Health Hospital, Shreveport, was closed February 10. It was the last of its kind in the United States.

On May 12, National Hospital Day, a state-wide campaign to collect $400,000 for the Charity Hospital, New Orleans, will be inaugurated.

Dr. J. G. Yearwood, Caspiana, has been elected Health Officer for Caddo Parish.

Dr. L. R. DeBuys, Professor of Pediatrics, Tulane University of Louisiana, New Orleans, was recently elected a member of the Board of Directors of the American Child Health Association.

Dr. Rudolph Matas, New Orleans, has been elected a member of the Royal Academy of Barcelona, Spain, also corresponding member of the Societe de Chirurgie at Paris.

Deaths

Dr. Jacob D. Graybill, New Orleans, aged 74, died February 1.

MARYLAND

The annual meeting of the Medical and Chirurgical Faculty of Maryland will be held in Baltimore April 24-26.

In the February issue of the JOURNAL, under this heading, we stated that "Dr. Keith Rice has been appointed by the staff of Johns Hopkins Hospital, Baltimore, as Assistant Resident Surgeon in the Church Home Infirmary, a branch of Johns Hopkins." The JOURNAL was in error, as

(Continued on page 36)

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the Church Home Infirmary is a private institution having no connection with Johns Hopkins Hospital.

The President of the Johns Hopkins University, Baltimore, has announced a conditional gift of $900,000 from an anonymous donor; also a grant of $2,000,000 to the University from the Carnegie Corporation. The latter gift will be used in the construction and maintenance of an outpatient dispensary and diagnostic clinic. The $900,000 gift is provisional on the raising of $1,000,000 by April 1. The Phipps fund of $60,000, formerly available each year for the maintenance of the psychiatric clinic, will cease on that date. The anonymous gift will be expended for the expansion as well as the endowment of the psychiatric clinic.

Johns Hopkins University, Baltimore, has bestowed the honorary degree of Doctor of Laws on Sir Auckland Campbell Geddes, British Ambassador at Washington.

Plans are being made to establish at the University of Maryland, Baltimore, a Department of Mental Hygiene, to be conducted as a mental hygiene clinic, where physicians from the state institutions will be in attendance, enabling them to come in contact with patients suffering from mental disorders in the incipient stages. The clinic will be an intermediate step between the home and hospitals.

The new building for the School of Hygiene and Public Health of Johns Hopkins University, Baltimore, is under way. It will be an eight-story structure and will cost $1,000,000. Work on the east wing of the new Women's Clinic of Johns Hopkins Hospital has been finished and preparations are being made for the erection of the left wing. The Pathologic Laboratory of the Medical School has been completed. The Woman's Clinic and the Pathologic Laboratory were erected at a cost of $900,000. Funds for the Public Health Building were supplied by endowment from the Rockefeller Foundation.

Dr. Charles M. Byrnes, Associate in Clinical Neurology at Johns Hopkins University, Baltimore, was recently elected President of the Philadelphia Neurological Society.

Dr. Daniel Jenifer has been appointed Health Officer for Baltimore County, to succeed Dr. John S. Green, resigned.

The Baltimore County Medical Society has elected Dr. Albert L. Wilkinson, President; Dr. Robert H. Riley, Secretary.

Dr. Alexius McGlannan, Chief Surgeon of the Mercy Hospital, Baltimore, has been appointed Consulting Surgeon for the Fort McHenry Hospital, Baltimore.

Dr. John W. Ebert has been appointed Physician to the Baltimore County Jail, Towson, succeeding Dr. J. R. Green, deceased.

Dr. Howard Barker has been appointed Medical Officer in charge of U. S. Veterans' Hospital No. 56, Fort McHenry.

Dr. Edward Mitchell Hanrahan, Jr., and Miss Evelyn Barton Randall, both of Baltimore, were married February 3.

Deaths

Dr. Howard R. Hopkins, Hillsboro, aged 70, died January 25 from influenza.

Dr. George T. Shower, Baltimore, aged 81, died February 2 from senility.

MISSISSIPPI

The Battle Creek treatments and an electrotherapy department has recently been added to Dr. H. H. Kinney's Infirmary at Okolona.

Dr. L. B. Ward, Shaw, and Miss Vivian McCool, Greenville, were married January 5.

Deaths

Dr. John Mason Phillips, Evansville, aged 63, died February 8.

Dr. J. Epps Pegram, Tiplersville, aged 72, died December 24 from intestinal obstruction.

MISSOURI

The annual meeting of the Missouri State Medical Asssociation will be held in Joplin, May 8-10.

Callaway County Medical Society has elected Dr. A. D. Ferguson, President; Dr. W. H. Williamson, Vice-President; Dr. M. Yates, Secretary-Treasurer.

Moniteau County Medical Society has elected Dr. L. L. Latham, Latham, President; Dr. J. P. Burke, California, Vice-President; Dr. R. H. Miller, California, Secretary-Treasurer.

Schuyler County Medical Society has elected Dr. J. C. Coffee, Queen City, President; Dr. A. J. Drake, Lancaster, Vice-President; Dr. J. B. Bridges, Downing, Secretary-Treasurer.

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(Continued from page 36)

The Health Conservation Association has been organized by the amalgamation of the Kansas City Tuberculosis Society and the committees for social hygiene, mental hygiene, dental hygiene and cancer control with offices in Kansas City. Campaigns against tuberculosis, cancer, venereal disease and other preventable or curable diseases will be conducted. R. E. Parsons, President of the City Tuberculosis Society, was elected President, and Dr. Scott P. Child, Treasurer.

The St. Luke's Hospital, Kansas City, which was built and equipped at a cost of approximately $700,000, was formally opened February 25. It has a capacity of 400 patients.

The staff of Boone County Hospital has re-elected the following officers: Dr. Frank G. Nifong, Columbia, Chief of Staff; Dr. J. E. Thornton, Columbia, Vice-Chairman; Dr. Wm. O. Fischer, Columbia, Secretary.

Dr. Franklin E. Murphy, Kansas City, has resigned as a member of the State Board of Health.

A banquet was recently given at Springfield in honor of Dr. Murray C. Stone and Dr. William R. Beatie, outgoing and incoming Presidents of the Green County Medical Society.

Dr. William F. O'Malley, Webster Groves, has been appointed Health Commissioner of St. Louis County.

Dr. Albert E. Holly, St. Joseph, has been appointed County Physician, succeeding Dr. Walter Hansen.

Dr. J. T. Thatcher has been named Deputy State Commissioner of Health for Holt County.

Dr. Horace W. Carle, St. Joseph, has been elected President of the City Board of Health, succeeding Dr. John M. Bell, resigned.

Dr. Percy J. Carroll, Major, M.C., U. S. Army, Jefferson Barracks, and Miss Helen Byrne, St. Louis, were married February 3.

Deaths

Dr. William Augustus Hardaway, St. Louis, aged 73, died February 3.

Dr. Albert Butler Stone, Lamar, aged 73, died February 3 at Pittsburg, Kan., from carcinoma of the prostate.

Dr. Henry L. Mann, Kansas City, aged 75, died February 13.

Dr. Joseph B. Morrison, Maryville, aged 86, died in February in New York.

Dr. Edwin D. F. Phillips, Kansas City, aged 81, died December 24 from chronic nephritis.

Dr. J. McLean Moulder, Kansas City, aged 73, died March 4 from heart trouble.

Dr. James A. Waterman, Breckenridge, aged 60, died March 2 at the St. Mary's Hospital, Jefferson City, following an operation.

Dr. James Claud Wilhoit, Kansas City, aged 38, died February 17 in a local hospital from pneumonia.

Dr. George Albert McCulloch, Excelsior Springs, aged 59, died February 13 as a result of injuries received when the car in which he was riding collided with a train.

Dr. DeWitt F. Eskew, Poplar Bluff, aged 74, died suddenly February 24 from acute indigestion.

Dr. Benjamin Franklin Wolfe, Carthage, aged 90, died February 22 from arteriosclerosis.

Dr. E. S. Carpenter, Kansas City, aged 90, died February 22.

Dr. Daniel Orville Abrams, Independence, aged 75, died suddenly February 27.

Dr. Gustav D. Heinrichs, St. Louis, aged 86, died February 14.

Dr. J. H. Rice, Quincy, aged 70, died early in February.

NORTH CAROLINA

The annual meeting of the North Carolina State Medical Association will be held in Asheville, April 17-19.

At the recent meeting of the Tri-State Association held in High Point, the following officers were elected: Dr. Charles O. H. Laughinghouse, Greenville, President; Drs. D. A. Stanton, High Point, W. L. Peple, Richmond, Va., and S. B. Sherrard, Gaffney, S. C., Vice-Presidents; Dr. James K. Hall, Richmond, Va., re-elected Secretary-Treasurer. The next meeting will be held in Greenville, S. C.

Raleigh Academy of Medicine has elected Dr. M. K. Gibson, Prsident; Dr. Hugh A. Thompson, Secretary; Dr. H. M. Bonner, Treasurer.

The bill to abolish the Department for the Criminal Insane at the State Prison and place the inmates in the State Hospitals for the Insane has been passed by the Senate. The Senate has also approved the transfer of control of the State Sanatorium for the Treatment of Tuberculosis from

(Continued on page 40)

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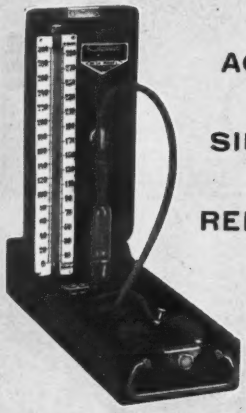

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(Continued from page 38)

the State Board of Health to a board of directors to be named by the Governor.

The Government has appropriated $25,000 for improvements to the North Carolina Orthopedic Hospital for Crippled Children, Gastonia, and $65,000 annually for the next two years for maintenance. The age limit of children who can enter the Hospital has been raised from 14 to 16 years.

Dr. Fletcher H. Harris, Henderson, has been elected Health Officer of Vance County to succeed Dr. Bomar A. Olds, who resigned to accept a position with the Rocky Mount Sanatorium.

Tranquil Park Sanitarium, Charlotte, was sold to the Homes Realty Company, Charlotte, in February. Patients have been transferred to other hospitals in Charlotte. Dr. John Q. Myers established the sanitarium for nervous and mental diseases in 1916 and will continue the same work, but will hospitalize his patients in other hospitals.

In order to meet the demand for trained directors in physical education throughout the State, the North Carolina College, Greensboro, has adopted a four years' course in hygiene and physical education.

Dr. J. T. Burrus, High Point, has been elected a member of the Guilford County Board of Health to succeed Dr. H. W. McCain, deceased.

Dr. Charles Daligny has been elected County Health Officer of Montgomery County.

Dr. J. W. Davis, Statesville, has bought the interest of the late Dr. Forest G. Carpenter in the Carpenter-Davis Hospital and will continue its operation.

An orthopedic clinic has been established at Charlotte. Dr. Alonzo Myers, who gives his services free, is in charge.

Deaths

Dr. Marvin LeRoy Smoot, Fayetteville, aged 46, died February 6 following a long illness.

Dr. Robert N. Cartwright, Fairfield, aged 65, died recently.

Dr. Isaac Arthur Harris, Weaverville, aged 84, died December 29 from cerebral hemorrhage.

Dr. George Alexander Graham, Raeford, aged 70, died February 1.

Dr. David Lucas, Enfield, died January 15.

OKLAHOMA

The annual meeting of the Oklahoma State Medical Association will be held in Tulsa, May 15-17.

Dr. Catherine Brydia, Ada, has been appointed Superintendent of Health of Pontotoc County.

Several physicians of Durant will purchase the Durant Memorial Hospital and it will be operated under the direction of the Bryan County Medical Society.

Dr. J. E. Walker, Shawnee, has been reappointed County Superintendent of Health of Pottawatomie County.

Dr. C. C. Richards, Marlow, has been appointed Health Officer for Stevens County.

The annual meeting of the Oklahoma Academy of Science was held at the University of Oklahoma February 10.

Dr. F. L. Walton, Muskogee, has been appointed Health Officer of Muskogee County, to succeed Dr. F. W. Ewing.

Dr. J. E. Arrington, Frederick, has been appointed Health Officer of Tillman County.

Dr. W. T. Mayfield, Norman, and Miss Delores Burrell, Santa Anna, Calif., were married in January.

Deaths

Dr. Leota S. Cunningham, Tulsa, aged 48, died February 7.

Dr. Benjamin Thomas Coppedge, Bristow, aged 70, died February 24.

(Continued on page 42)

Dr. H. H. Kinney's Infirmary

OKOLONA, MISS.

Has recently added the Original Battle Creek Treatments and an Electrotherapy Department. For further information address Dr. Kinney's Infirmary, Okolona, Miss., Mrs. Juliet King, Secy.

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2 CC	1.00	1 CC TB	2.00	10 CC	2.50	30 CC	4.00
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(Continued from page 40)

Dr. Waverly McGee Hume, Coalgate, aged 60, died February 3 in Sherman, Tex., from erysipelas.

SOUTH CAROLINA

The annual meeting of the South Carolina State Medical Association will be held in Charleston, April 17-19.

Columbia County Medical Society has elected Dr. N. B. Heyward, President; Dr. F. M. Routh, Vice-President; Dr. W. P. Cornell, Secretary-Treasurer.

Florence County Medical Society has elected Dr. L. B. Salters, President; Dr. E. M. Allen, Vice-President; Dr. M. R. Mobley, Secretary.

Laurens County Medical Society has elected Dr. H. S. Black, President; Dr. R. R. Walker, Vice-President; Dr. J. W. Davis, Secretary-Treasurer.

Orangeburg County Medical Society has elected Dr. C. I. Green, Orangeburg, President; Dr. A. L. Black, Bowman, Vice-President; Dr. G. M. Truluck, Orangeburg, Secretary-Treasurer.

The following have been elected Trustees of the Board of the Medical College of the State of South Carolina, Charleston: Drs. Gottlob A. Neuffer, Abbeville, Larkin H. Jennings, Bishopville, E. H. Barnwell, Charleston, and D. T. Riley, Florence.

Deaths

Dr. James M. McCallum, Leeds, aged 87, died January 21 from senility.

Dr. William A. Ross, Forkshoals, aged 56, died at Greenville January 30 from heart disease.

Dr. Rufus Berley Epting, Greenwood, aged 66, died February 18.

Dr. B. F. Few, Greer, died January 23.

TENNESSEE

The annual meeting of the Tennessee State Medical Association will be held in Nashville, April 10-12. Clinics will he held during the mornings of the first two days; reading of papers will be in the afternoons of the first two days and morning and afternoon of the last day.

Blount County Medical Society has elected Dr. W. B.

(Continued on page 44)

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(Bailey-Terrell Laboratories).

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(Continued from page 42)

Lovingood, President; Dr. E. L. Ellis, Vice-President; Dr. F. A. Zoller, Secretary-Treasurer.

Dickson County Medical Society has elected Dr. H. Weaver, President; Dr. J. J. Teas, Vice-President; Dr. W. J. Sugg, Secretary-Treasurer, re-elected.

Henry County Medical Society has elected Dr. W. Q. Hagler, Haglersville, President; Dr. R. O. Perry, Manleyville, Vice-President; Dr. J. T. Freeman, Paris, Secretary.

Lauderdale County Medical Society has elected Dr. R. B. Wilson, Gates, President; Dr. J. L. Dunavant, Henning, First Vice-President; Dr. W. C. Sanford, Ripley, Second Vice-President; Dr. W. V. Sanford, Ripley, Secretary-Treasurer.

Putnam County Medical Society has elected Dr. Z. L. Shipley, President; Dr. J. T. Moore, First Vice-President; Dr. J. MacWheeler, Second Vice-President; Dr. Lex Dyer, Secretary-Treasurer.

Weakley County Medical Society has elected Dr. C. M. Sebastian, Martin, President; Dr. J. M. Stewart, Martin, Vice-President; Dr. B. B. Parish, Dresden, Secretary-Treasurer, re-elected.

White County Medical Society has elected Dr. C. E. Tubb, President.

Dr. George M. Brandau, Clarksville, has accepted an appointment as a member of the staff of the New Jersey State Hospital for Nervous and Mental Diseases, Greystone Park, N. J.

Deaths

Dr. John R. Harwell, Nashville, aged 86, died February 7 from senility.

Dr. Harry Hilton Brown, Jasper, aged 26, died February 22 at the Oakville Sanitarium, Memphis, from pneumonia.

TEXAS

The annual meeting of the Texas State Medical Association will be held in Fort Worth, May 8-10.

Austin County Medical Society has elected Dr. Bernard E. Knolle, Industry, President; Dr. Herbert E. Roensch, Kenney, Vice-President; Dr. Otto E. Steck, Bellville, re-elected Secretary-Treasurer.

(Continued on page 46)

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Gentlemen:
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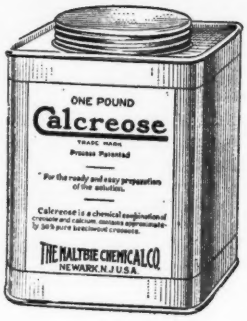

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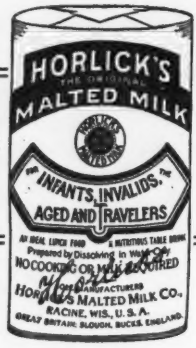
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(Continued from page 44)

Bastrop County Medical Society has elected Dr. C. H. Otken, Paige, President; Dr. Geo. M. Jones, Smithville, Vice-President; Dr. T. B. Taylor, Bastrop, Secretary-Treasurer.

Bexar County Medical Society has elected Dr. E. W. McCamish, President; Dr. Minnie C. O'Brien, Vice-President; Dr. R. Stuart Adams, Secretary; Dr. C. E. Scull, Treasurer.

Bowie County Medical Society has elected Dr. J. W. E. Beck, DeKalb, President; Drs. E. M. Watts, Texarkana, and W. E. Womack, Redwater, Vice-Presidents; Dr. C. A. Smith, Texarkana, Secretary-Treasurer.

Caldwell County Medical Society has elected Dr. E. A. Benbow, Luling, President; Dr. H. B. Henry, Luling, Secretary-Treasurer.

Clay County Medical Society has elected Dr. L. F. Crook, Bellevue, President; Dr. J. A. Allison, Henrietta, Vice-President; Dr. J. H. Ferris, Secretary-Treasurer.

Childress-Collingsworth-Donley-Hall County Medical Society has elected Dr. H. L. Wilder, Clarendon, President; Drs. E. W. Moss, Wellington, J. H. Jernigan, Childress, and J. M. Ballew, Memphis, Vice-Presidents; Dr. O. L. Jenkins, Clarendon, Secretary-Treasurer.

Comal-Guadalupe County Medical Society has elected Dr. F. R. Karbach, Marion, President; Dr. L. G. Wille, New Braunfels, Vice-President; Dr. M. B. Brandenburger, Seguin, Secretary-Treasurer.

Cooke County Medical Society has elected Dr. E. C. Mead, Gainesville, President; Dr. D. M. Higgins, Gainesville, Vice-President; Dr. Jas. M. Wattam, Gainesville, Secretary.

Denton County Medical Society has elected Dr. T. C. Dobbins, Denton, President; Dr. Rebecca M. Evans, Denton, Vice-President; Dr. M. D. Fullingim, Denton, Secretary-Treasurer.

DeWitt County Medical Society has elected Dr. H. H. Brown, Jr., Yoakum, President; Dr. L. W. Nowierski, Yorktown, Vice-President; Dr. B. J. Nowierski, Yorktown, Secretary-Treasurer.

Ellis County Medical Society has elected Dr. Samuel L. Wadely, Palmer, President.

Fisher-Stonewall County Medical Society has elected Dr. J. G. Hambright, Roby, President; Dr. B. F. Reaves, Rotan,

(Continued on page 48)

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Lactic cultures have also proven their worth in combating external low-grade infections of non-pathogenic nature.

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(Continued from page 46)

Vice-President; Dr. W. W. Callan, Rotan, Secretary-Treasurer.

Gonzalez County Medical Society has elected Dr. N. A. Elder, Nixon, President; Dr. W. T. Dunning, Gonzalez, Vice-President; Dr. W. T. Dawe, Gonzalez, Secretary-Treasurer.

Grayson County Medical Society has elected Dr. Paul Gunby, Sherman, President; Dr. D. K. Jamison, Denison, Vice-President; Dr. W. A. Lee, Denison, Secretary-Treasurer.

Hamilton County Medical Society has elected Dr. C. E. Chandler, Hamilton, President; Dr. Raymond Tull, Carlton, Vice-President; Dr. C. C. Cleveland, Hamilton, Secretary-Treasurer.

Hemphill-Roberts County Medical Society has elected Dr. E. H. Snyder, Canadian, President; Dr. W. J. Brewer, Perryton, Vice-President; Dr. L. V. Dawson, Canadian, Secretary-Treasurer.

Parker-Palo Pinto County Medical Society has elected Dr. C. B. Williams, Mineral Wells, President; Dr. R. H. Smith, Palo Pinto, Vice-President; Dr. E. F. Yeager, Secretary-Treasurer.

Smith County Medical Society has elected Dr. Elbert D. Rice, President; Dr. Hugh H. Wisdom, Secretary.

Upshur County Medical Society has elected Dr. J. M. Griffith, Big Sandy, President; Dr. G. A. Taylor, Bettie, Vice-President; Dr. H. J. Childress, Gilmer, Secretary-Treasurer.

Wilbarger County Medical Society has elected Dr. Howard Reger, Vernon, President; Dr. A. B. Garland, Vernon, Vice-President; Dr. Richard W. Hix, Vernon, Secretary.

The Texas Public Health Association, at its recent meeting in Austin, elected the following officers: J. W. Butler, Galveston, President; Drs. Elva A. Wright, Houston, and J. B. McKnight, Sanatorium, Vice-Presidents; Dr. Zachary T. Scott, Austin, Secretary; H. W. Wroe, Austin, Treasurer.

Dr. William H. Beazley, Lufkin, has been appointed State Health Officer, succeeding Dr. J. H. Florence.

The forty-third annual convention of the Texas State Dental Society will meet in Fort Worth, April 16-18.

The new city hospital at Teague was opened in December.

(Continued on page 50)

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The place of CÉLESTINS Vichy in the dietary is distinctive and important. It is an alkaline water of diuretic action, and is indicated in cases of the following:

Chronic hepatic disorders; gastric and intestinal indigestions; acid dyspepsia; chronic catarrhal gastritis or enteritis; rheumatism; diabetes; inflammation of the bladder; and a large number of minor ailments.

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A booklet on the therapeutic uses of CÉLESTINS Vichy will be sent on request.

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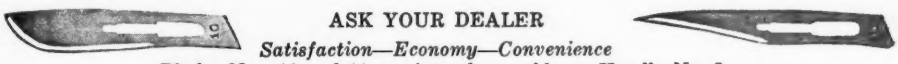
Blade No. 23 interchangeable with Nos. 20, 21 and 22 on Handle No. 4



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The **BRAND LABORATORIES** have developed a process of drying brewers' yeast so that it can be administered in capsules and still retain all of its fermentative power and vitamin content. It is a so-called live brewers' yeast.

BRAND'S BREWERS' YEAST is the equal in every way of the wet brewers' yeast obtained from the fermenting vats. It is dispensed in capsules only.

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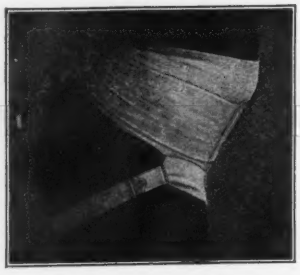

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KATHERINE L. STORM, M.D.,
Originator, Patentee, Owner and Maker
1701 Diamond St. Philadelphia

(Continued from page 48)

The Masonic Hospital, El Paso, has elected the following officers: Dr. Felix P. Miller, re-elected President; Dr. J. M. Richmond, re-elected Vice-President; Dr. E. J. Cummins, Secretary-Treasurer.

The Dallas Child Guidance Clinic was recently opened. The clinic was established through the commonwealth fund of New York. Quarters in the Baylor Hospital were given free of charge, and furniture and other equipment was obtained through the efforts of County Judge Arch C. Allen.

It has been announced that improvements involving an expenditure of $50,000 will be made at the William Beaumont General Hospital, Fort Bliss.

Deaths

Dr. Edwin DeMoss Lunn, Houston, aged 51, died suddenly January 20 from carbolic acid poisoning.

Dr. L. C. Downtain, Eastland, aged 63, died February 8 from cerebral hemorrhage.

Dr. Milton C. McBride, Dallas, aged 64, died February 7.

Dr. J. H. Morrow, Blue Ridge, aged 69, died January 27 from influenza.

Dr. Reuben C. Fisher, Belton, aged 52, was found dead in his office January 30 from heart disease.

Dr. Horace Marshall Brown, Dallas, aged 66, died December 16 from aortic insufficiency.

Dr. Robert Shelby Wilson, Gainesville, aged 58, died February 20 from pneumonia.

VIRGINIA

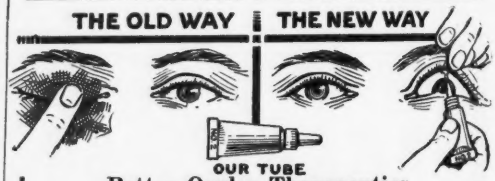
The Richmond Tuberculosis Association has re-elected Dr. Garnett Nelson, Richmond, President, and Miss Nora Spencer Hamner, Executive Secretary.

Dr. William P. Gilmer, Clifton Forge, has gone to Korea, where he will work as a medical missionary under the auspices of the Southern Presbyterian Church.

The contract has been let for the construction of the Virginia Baptist Hospital, Lynchburg. The cost will be approximately $200,000.

(Continued on page 52)

THE OLD WAY | THE NEW WAY



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(Continued from page 50)

The Rockingham Memorial Hospital, Richmond, is the beneficiary of $10,000 in the will of Miss Clara Chaunceauline, who died recently.

Dr. Howard F. Smith, Surgeon, U. S. Public Health Service, Quarantine Officer in charge at Hampton Roads, has been transferred to Manila, P. I.

Dr. William Hamilton Dulaney, Lynchburg, has been re-elected Surgeon to the Garland-Rhodes Camp, Confederate Veterans.

Dr. Robert Hall Harrington and Miss Ruth Ione Hammond, both of Richmond, were married December 23.

Dr. James M. Miller, Captain, M.C., U. S. Army, Fort Eustis, and Miss Bessie E. V. Keil, Walhalla, S. C., were married February 3.

Deaths

Dr. William H. H. Tate, Heflin, aged 81, died February 2 from senility.

Dr. James Philip Roy, Richmond, aged 61, died January 25 from Bright's disease.

Dr. Orion Baum, Vine, aged 63, died January 9.

WEST VIRGINIA

The annual meeting of the West Virginia State Medical Association will be held in Beckley, June 19-21.

McDowell County Medical Society has elected Dr. C. R. Woolwine, Davy, President; Dr. Victor L. Weatherby, Welch, Vice-President; Dr. J. Howard Anderson, Marytown, Secretary; Dr. J. L. Sameth, Welch, Treasurer.

Kanawha Medical Society has elected Dr. George H. Barksdale, Charleston, President; Dr. Raymond H. Dunn, South Charleston, Vice-President; Dr. Wm. P. Black, Charleston, Secretary-Treasurer.

Deaths

Dr. Hitzel C. LeBlond, McCurdysville, aged 65, died January 29.

Dr. John W. Kidd, Burnsville, aged 66, died February 2 from cerebral hemorrhage.

Dr. Lester Ours, Wheeling, died at the Ohio Valley General Hospital February 13 from appendicitis.

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FOR SALE—Complete Clow Hydro-therapeutic Equipment; Marble Controller Table; Electric Light Cabinet; Steel Hot Cabinet; Sitz Tub; Shower and Needle. Address Buckstaff Bath House Co., Hot Springs National Park, Arkansas.

EXAMINATION NOTICE—An examination for the position of Health Officer of the City of Savannah, Ga., will be held on April 20-21, 1923, at the United States Marine Hospitals in Boston, Baltimore, Savannah, New Orleans, St. Louis and Chicago, under the supervision of the surgeons in charge; and at the Hygienic Laboratory, Washington, D. C. The Surgeon-General of the United States Public Health Service has appointed an examining committee composed of Assistant Surgeon-General W. F. Draper, Surgeon L. L. Lumsden and Surgeon Geo. W. McCoy. Candidates will be rated on personal qualifications, ability, education and experience, in addition to a written examination. The examination will be identical at all places held. Salary, $4,800.00 per annum and automobile furnished. The position is guaranteed free from political interference. Further information can be had from any of the Surgeons of the United States Marine Hospitals named above, from Assistant Surgeon-General W. F. Draper, Washington, D. C., or from Dr. Herman W. Hesse, Chairman Health Committee, City Hall, Savannah, Ga.

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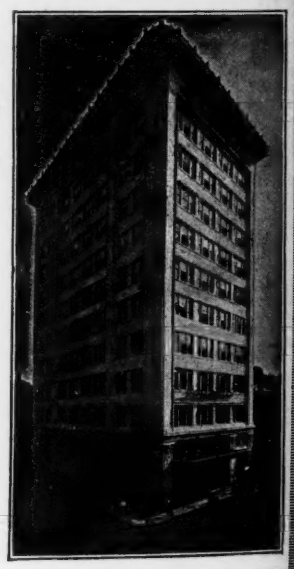
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ALTHOUGH epinephrin has a known, definite chemical constitution, its activity cannot be gauged by chemical methods of assay. This is so because there are two kinds of epinephrin molecules, one of which is physiologically active and the other practically inactive—and yet both are correctly designated by the formula $C_9H_{13}NO_3$.

The physiologically active variety of epinephrin has the property of rotating the ray of polarized light in the polarimeter to the left and is therefore called "laevorotatory," and the other—the less active kind—turns the light to the right; it is dextrorotatory.

Chemical tests can show only the quantity of epinephrin present in a given specimen, but cannot distinguish between the active and the inactive—the laevo and the dextro. For instance, a preparation composed of 40% dextro and 60% laevo would be only 60% active, but would register 100% on chemical test.

One of the unsolved chemical mysteries is the fact that natural epinephrin (derived from suprarenal glands and other chromaffinic tissue) is all laevorotatory, whereas the epinephrin that is produced synthetically is 50% dextro and 50% laevo, though this ratio can be modified by subsequent chemical treatment, and synthetic preparations can be brought up to standard activity.

The original epinephrin preparation, Adrenalin, is of course the natural product. But we are not content with the assurance of activity which the manufacture of the natural product might be expected to give us; every batch of Adrenalin is subjected to physiological assay, the pressor test. This consists essentially of comparing the effect of the as yet untested specimen of Adrenalin on the blood pressure of an animal with the effect of a known 100% standard sample. Kymograph readings are carefully measured and by this means we are enabled to adjust every bottle of Adrenalin Solution to 100% physiological activity.

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